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KEY TO
COMPLETE ARITHMETIC

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Greenleaf's Mathematical Series.

KEY

TO

COMPLETE

ARITHMETIC.

ON THE BASIS OF WORKS

By BENJAMIN GREENLEAF, A.M.

THOS. R. SHEWELL & COMPANY
BOSTON NEW YORK CHICAGO

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KEY TO THE COMPLETE ARITHMETIC.

Article 37.

44. 1009.
45. 669.
46. 698.
47. 759.
48. $989.
49. $499.
50. $1465.
79. 1484.
80. 1149.
81. $31.355.
82. $39.928.
83. $61.665.
84. $317.40.

Article 39.

85. 689.
86. 1978.
87. 2396.
88. 15485.
89. 2052.
90. 9788.
91. 2018.7.
92. 143.91.
93. $131.31.
94. $100.66.
95. $393.30.
96. $230.05.
97. 3018.
98. 3443.
99. 7736.
100. 2023.
101. 2026.
102. 16986.
103. 176.40.
104. 153.89.
105. 281.72.
106. 5233.97.
107. $125.65.
108. $511.69.
109. $168.08.
110. $532.40.
111. 998.
112. 4391.
113. $9665.68.
114. 5619.
115. $75.13.
116. 318381.
117. $145.17.
118. $360.
119. $14170.70.
120. 2815
121. 24445.
122. 313.54.
123. 150.390.
124. 29002 ft.
125. 3578392.
126. $1046.87.
127. $175430.
128. 62611.
129. $39320.
130. $1323925.63.
131. 1863189.
132. 563972744718.
133. 509006545503.418.
134. 323497.
135. 340522022.
136. 1380855.262.
137. $32545.24.
138. $24005.79.

Article 46.

45. 332.
46. 223.
47. 205.
48. 222.
49. 1114.
50. 3212.
51. 2213.
52. 1118.
53. 1221.
54. $325.
76. 309.
77. 192.
78. 192.
79. 46.65.
80. 803.153.
81. $391.05.
82. $55.14.
83. $338.80.

Article 48.

84. 5196.
85. 4969.
86. 1859.
87. 1056.
88. 29962.
89. 3541.
90. 56.39.
91. 14.251.
92. $6.27.
93. $83.96.
94. $95.81.
95. $29.99.
97. 34456.
98. 97820.
99. 22968.
100. 9903.
101. 9154.
102. 1.
103. 6.552.
104. 811.95.
105. 9615.5.
106. 78.44.
107. $486.57.
108. $1836.75.
109. 5541.
110. 26983.
111. 11001.
112. 107.91.
113. 389.
114. $740.75.
115. 163864.
116. $4066.94.
117. 269535.
118. 267369.
119. 1785837.

MISCELLANEOUS EXERCISES.

120.

$190.00	$767.50
131.00	476.25
155.25	$291.25, Ans.
$476.25	

121.

	$3769.00
$1728.00	2648.75
1161.93	$6417.75
$2889.93	2889.93
	$3527.82, Ans.

122.

1882	991	1882	1882
991	431	1422	1602
891, 1st Ans.	1422	460, 2d Ans.	280, 3d Ans.

123.

$178.50, Sydney.
75.75
$254.25, Albert.
178.50
432.75
80.93
$351.82, Charles.
178.50
$173.32, Ans.

124.

1645
635
416
2696
1314
1382, Ans.

125.

1575
1658
3233

4563
3233
Ans. 1330 mi.

126.

$8555.50
7000.00
9563.75
20000.00
$45119.25

127.

362535
104760
467295

847542
467295
380247, Ans.

$50675
45119.25
$5555.75, Ans.

128.

$51.75
84.93
267.00
$403.68

$1250.00
403.68
846.32
185.00
$1031.32, Ans.

Article 58.

38. 3024.
39. 13701.
40. 5545.
41. 49608.
42. 20496.
43. 5216.

44. 86415.
45. 218709.
47. 280.56.
48. 30.675.
49. 3271.8.

50. 49899.71.
51. $497.40.
52. $1155.282.
53. $6588.
54. $76838.76.

81.
763
37
5341
2289
28231, Ans.

82.
1345
45
6725
5380
60525, Ans.

83.
406
25
2030
812
10150, Ans.

84.
1621
34
6484
4863
55114, Ans.

85.
134.7
86
8082
10776
11584.2, Ans.

86.
17.58
285
8790
14064
3516
5010.30, Ans.

87.
3.049
329
27441
6098
9147
1003.121, Ans.

88.
25.75
703
7725
18025
18102.25, Ans.

Article 60.

89.
347
769
3123
2082
2429
266843, Ans.

90.
826
243
2478
3304
1652
200718, Ans.

91.
90.4
85
4520
7232
7684.0, Ans.

92. \$32.13
91
3213
28917
\$2923.83, Ans.

93. 456.7
68
36536
27402
31055.6, Ans.

94. 8.901
542
17802
35604
44505
4824.342, Ans.

95. \$23.45
397
16415
21105
7035
\$9309.65, Ans.

96. 6789.0
645
339450
271560
407340
4378905.0, Ans.

97. \$198.06
805
99030
158448
\$159438.30, Ans.

98. 45.32
907
31724
40788
41105.24, Ans.

99. 982.4
3004
39296
29472
2951129.6, Ans.

100. \$60.51
768
48408
36306
42357
\$46471.68, Ans.

101. 87.35
94
34940
78615
8210.90, Ans.

102. \$80.42
832
16084
24126
64336
\$66909.44, Ans.

103. 30.69
907
21483
27621
27835.83, Ans.

104. \$817.42
358
653936
408710
245226
\$292636.36, Ans.

105. 8.439
125
42195
16878
8439
1054.875, Ans.

106. 86491
683
259473
691928
518946
59073353, Ans.

107. 49382
294
197528
444438
98764
14518308, Ans.

108. $887.95
761
88795
532770
621565
$675729.95, Ans.

109. 4963
845
24815
19852
39704
4193735, Ans.

110. $28.59
927
20013
5718
25731
$26502.93, Ans.

111. 938.42
347
656894
375368
281526
325631.74, Ans.

112. 61904
869
557136
371424
495232
53794576, Ans.

113. $329.87
35
164935
98961
$11545.45, Ans.

114. 42935
942
85870
171740
386415
40444770, Ans.

115. $864.23
346
518538
345692
259269
$299023.58, Ans.

116. 84917
809
764253
679336
68697853, Ans.

117. $73.24
935
36620
21972
65916
$68479.40, Ans.

118. $98.983
871
98983
692881
791864
$86214.193, Ans.

119. 295
163
885
1770
295
48085 lbs., Ans.

120. 1468
87
10276
11744
127716, Ans.

121. 681
507
4767
3405
345267
12
690534
345267
4143204, Ans.

122. 804.51 × 63 = 241353 + 482706 = 50684.13, Ans.

123. 914.08 × 64 = 365632 + 548448 = 58501.12, Ans.

124. $82.50 × 25 = 41250 + 16500 = $2062.50, Ans.

125. 5414.015 × 38 = 43312120 + 16242045 = 205732.57, Ans.

126. 8304.5 × 77 = 581315 + 581315 = 639446.5, Ans.

127. 7038.61 × 126 = 4223166 + 1407722 + 703861 = 886864.86, Ans.

128. 824.84 × 424 = 329936 + 164968 + 329936 = 349732.16, Ans.

129. $62.005 × 91 = 62005 + 558045 = $5642.455, Ans.

130. $47.168 × 208 = 377344 + 94336 = $9810.944, Ans.

131. $617.43 × 355 = 308715 + 308715 + 185229 = $219187.65, Ans.

132. 5634 × 47 = 39438 + 22536 = Ans. 264798 bu.

133. 965.13 × 3705 = 482565 + 675591 + 289539 = 3575806.65, Ans.

135. 473970.

136. 7854000; 138000.

Article 61.

138. 814000.

139. 274470.

140. 493020.

141. 603900.

142. $67244.10.

143. 2760720.

144. $3208100.

145. 2051636.8.

146. 27306000.

147. $23364000.

148. 16320000 mi.

149. 4992000 acres.

MISCELLANEOUS EXERCISES.

150.

$19.50
8
$156.00, cost of feed.
170.00 " flour.
63.25 " oats.
$389.25

$8.50
20
$170.00, cost of flour.

$500
389.25
$110.75, Ans.

151.

416
3
1248, wounded.
416
1664, total loss of army.
5
8320, enemy's loss.
1664
9984, Ans.

152.

$4.25
52
850
2125
$221.00, cost of board.

$1.30
52
260
650
$67.60, cost of cigars, etc.

$221.00, board.
150.00, expenses.
67.60, cigars, etc.
$438.60, spent.

$1500.00
438.60
$1061.40, saved.
67.60
Ans. $1129.00, what he could have saved.

153.

31.50
16.25
15.25 mi. apart in 1 hour.
48
12200
6100
Ans. 732.00 mi. apart in 48 hours.

154.

1360
120
27200
1360
Ans. 163200 lb.

155.

56
29
27 girls.
79
243
189
2133 lb., weight of girls.

85
29
765
170
2465 lb., weight of boys.
2133
Ans. 4598 lb.

156.

$3.75
130
11250
375
$487.50, cost of cloth.

$573.95
487.50
Ans. $86.45, gain.

157.

842
796
46, dif.
2
92

842
796
1638
92
3276
14742
150696, Ans.

158.

$31.50
40
$1260.00

$4.25
22
850
850
$93.50

$1260.00, cost of boards.
93.50 " shingles.
$1353.50, Ans.

159.

$2500
1900
$4400

$75
60
$4500, cost of land

$4500
4400
$100, Ans.

160.

$2.75	$1.80
17	114
1925	720
275	180
$46.75	180
	$205.20

$46.75, cost of silk.
205.20 " carpet.
17.00 " lining.
$268.95, Ans.

161.

$50	$4.25
60	120
$3000	8500
	425
$50	$510.00
20	
$1000, ret.	

$45.50	$125
28	5
36400	$625
9100	
$1274.00, cost of cows.	
3000 " oxen.	
510 " sheep.	
625 " horses.	
$5409	
1000	
$4409, Ans.	

162.

325	$1.65
24	1.48
1300	.17, gain on 1 bu.
650	
7800 bu.	
.17	
54600	
7800	

Ans. $1326.00, gain.

Article 71.

36. 383.
37. 821.
38. 971.
39. 1142.
40. 58.6.
41. 12.23.
42. 11.90.
43. 4.467.
45. $715\frac{1}{8}$.
46. $678\frac{7}{12}$.
47. $612\frac{3}{8}$.
48. $8423\frac{4}{7}$.
49. $673\frac{1}{4}$.
50. 13.34.
51. $60.71\frac{1}{8}$.
52. $4.348\frac{4}{5}$.
53. 405.
54. $205\frac{3}{7}$ mi.
55. $5.45.
56. $2313\frac{1}{8}$.

Article 72.

69. $470\frac{8}{21}$.
70. 234.
71. $1359\frac{21}{23}$.
72. 5.63.
73. 1.063.
74. 50.5.

Article 74.

76. $3.18, Ans.

77. $32.02, Ans.

78.

$990\frac{202}{351}$, Ans.

351) 347692
3159
3179
3159
202

79.

$10.67\frac{109}{793}$, Ans.

793) 8468.31
793
5383
4758
6251
5551
700

80.

$965\frac{54}{982}$, Ans.

982) 947684
8838
6388
5892
4964
4910
54

81.

$4.47\frac{219}{735}$, Ans.

735) 3287.64
2940
3476
2940
5364
5145
219

82.

$5.509\frac{235}{1234}$, Ans.

1234) 6798.341
6170
6283
6170
11341
11106
235

83.

$\$8.503\frac{15}{987}$, Ans.

987) $8392.476
7896
4964
4935
2976
2961
15

84.

$505\frac{4040}{5942}$, Ans.

5942) 3004760
29710
33760
29710
4050

85.

$1487\frac{613}{873}$, Ans.

873) 1298763
873
4257
3492
7656
6984
6723
6111
612

86.

$75\frac{375}{841}$, Ans.

841) 63450
5887
4580
4205
375

87.

$2.056\frac{706}{2007}$, Ans.

2007) 4127.098
4014
11309
10035
12748
12042
706

88.

$8.75\frac{696}{987}$, Ans.

987) 8643.21
7896
7472
6909
5631
4935
696

89.

$643 \times 857 = 551051$

$1208\frac{203}{456}$, Ans.

456) 551051
456
950
912
3851
3648
203

90. $984 \times 895 = 880680$.

$2453\frac{53}{359}$, Ans.

359) 880680
718
1626
1436
1908
1795
1130
1077
53

91. $8964 \times 73 = 654372$.

$6888\frac{12}{95}$, Ans.

95) 654372
570
843
760
837
760
772
760
12

92. $125, Ans.

85) $10625
85
212
170
425
425

93. 24, Ans.

$225) $5400
450
900
900

94. $6848.76\frac{42}{98}$, Ans.

98) $671178.90
588
831
784
477
392
858
784
749
686
630
588
42

95. $26\frac{10}{115}$, Ans.

115) 3000
230
700
690
10

96. $3.44\frac{240}{512}$, Ans.

512) 1763.68
1536
2276
2048
2288
2048
240

97.

3007, Ans.

2135) 6419945
6405
14945
14945

98.

$114\frac{52}{432}$, Ans.

432) 49300
432
610
432
1780
1728
52

99.

342, Ans.

2047) 700074
6141
8597
8188
4094
4094

100.

$52.88, Ans.

108) $5711.04
540
311
216
950
864
864
864

101.

$136\frac{380}{385}$, Ans.

365) $50000
365
1350
1095
2550
2190
360

103.

$61.87\frac{22}{44}$, Ans.

44) 2722.50
264
82
44
385
352
330
308
22

104.

106.558$\frac{12}{86}$, Ans.

86) 9164.000

86

564

516

480

430

500

430

700

688

12

105.

$31.25, Ans.

404) $12625.00

1212

505

404

1010

808

2020

2020

106.

137.125, Ans.

128) 17552.000

128

475

384

912

896

160

128

320

256

640

640

107.

30303$\frac{1}{33}$, Ans.

33) 1000000

99

100

99

100

99

1

Article 75.

110. $19.65.

111. 39.62; 3.962.

112. 45.54.

113. 137$\frac{66}{80}$

114.

1090.18$\frac{18}{100}$, Ans.

54.00) 58869.90

54

486

486

99

54

450

432

18

115.

28$\frac{9272}{51000}$, Ans.

51|000) 1437|272

102

417

408

9272

116.

4941$\frac{18}{186000}$ sec., Ans.

186|000) 92000|000

744

1760

1674

860

744

116000

117.

1024$\frac{4469}{8291}$, Ans.

8291) 8496453

8291

20545

16582

39633

33164

6469

118.

768$\frac{3078}{3782}$, Ans.

3782) 2907654

26474

26025

22692

33334

30256

3078

119.

58881$\frac{148}{1234}$, Ans.

1234) 72659302

6170

10959

9872

10873

9872

10010

9872

1382

1234

148

120.

$11956\frac{3844}{5678}$, Ans.

5678) 67890123

5678
11110
5678
54321
51102
32192
28390
38023
34068
3955

121.

$1.542\frac{2028}{2961}$, Ans.

2961) 4567.890

2961
16068
14805
12639
11844
7950
5922
2028

122.

$.529\frac{216}{349}$, Ans.

349) 184.837

1745
1033
698
3357
3141
216

123.

$977\frac{1908}{6384}$, Ans.

6384) 6239076

57456
49347
44688
46596
44688
1908

124.

$1.788\frac{123}{945}$, Ans.

945) 1689.783

945
7447
6615
8328
7560
7683
7560
123

125.

$849 \times 863 = 732687.$

$585\frac{267}{1252}$, Ans.

1252) 732687

6260
10668
10016
6527
6260
267

126.

$84 \times 96 \times 25 = 201600$

$169\frac{659}{1189}$, Ans.

1189) 201600

1189

8270

7134

11360

10701

659

127.

$694 \times 87 + 956 = 61334$

$100\frac{434}{609}$, Ans.

609) 61334

609

434

128.

$847 \times 12 \times 900 = 9147600$

9) 9147600

1016400, Ans.

129.

$9008 \times 7080 = 63776640$

$30515\frac{2890}{20990}$, Ans.

209|0) 6377664|0

627

1076

1045

316

209

1074

1045

290

130.

$1.11\frac{215}{850}$, Ans.

850) $945.65

850

956

850

1065

850

215

131.

$843 - 159 = 684$

$29 \times 7 = 203$

203) 684 ($3\frac{75}{203}$, Ans.

609

75

132.

$.871\frac{400}{975}$, Ans.

975) $849.625

7800

6962

6825

1375

975

400

MISCELLANEOUS EXERCISES.

133. $3) $7665

2555 bbl., Ans.

134. 25

31

56 miles apart in 1 day.

101 days, Ans.

56) 5656

56

56

56

135. 2240 240

2000 25 2000) 6000

240 1200 3 short tons, Ans.

480

6000 lb., gain.

136.

$34	$20.40	$1734	75	
75	85	2550	85	26.77\frac{80}{160}$, Ans.
170	10200	$4284	160) $4284.00	
238	16320		320	
$2550	$1734.00		1084	
			960	
			1240	
			1120	
			1200	
			1120	
			80	

137. 14, Ans.

$15

12

30

15

$180 $180) $2520

180

720

720

138. 640, Ans.

15|0) 9600|0

90

60

60

139.

$3286 − 2650 = $636, gain.

$6) $636 = 106, Ans.

140.

15 × 35 × 75 × 45 = 525

525) 33600 = 64, Ans.

3150

2100

2100

141.

78|00) 2744|00 = 35 States, Ans.

234

404

390

1400 sq. mi. over.

142.

35|0) 26250|0 = 750, Ans.

245

175

175

143.

$8|0) $448|0 = 56 acres.

40

48

48

144.

1002) 71142 = 71, Ans.

7014

1002

1002

145.

159 × $5 = $795, cost of wood.

$795 − 144 = $651

$3) $651 = 217 sheep, Ans.

Article 76.

33. 55405 − 52198 = 3207, Ans.

34. 74760 − 34943 = 39817, Ans.

35. 5496 − 4004 = 1492, Ans.

36. $2560.75 − 375.87 = $2936.62

$5000.00 − 2936.62 = $2063.38, Ans.

37. 664 × 19

5976

664

12616, Ans.

38.

$7896.84
5670.00
$2226.84, gain.

6) $2226.84
$371.14, Ans.

39.

$0.11
0.09
$0.02, gain on 1 lb.

255
3
765 lb.
$0.02
$15.30, Ans.

40.

223
61
162 miles.
6 days, Ans.
27) 162
162

41.

$97
365
485
582
291
$35405, Ans.

42.

596
48
4768
2384
28608
10
28618, Ans.

43.

$0.15 $0.28 $0.76 $2.55
17 46 16 12.88
105 168 456 12.16
15 112 76 $27.59
$2.55 $12.88 $12.16

$42.57
27.59
$14.98

$0.14, Ans.
107) $14.98
10 7
4 28
4 28

44.

$1549.60
1472.50
$77.10, gain.

0.24\frac{78}{310}$, Ans.
310) $77.10
62 0
15 10
12 40
2 70

45.

$\$12 \times 144 = \$1728$

$\$15 \times 144 = \$2160$

$252 \text{ acres} = \$3348$, cost.

$\$18 \times 252 = \$4536$

$\$4536 - \$3348 = \$1188$, gain.

$252)\$1188.00 = \$4.71\frac{108}{252}$, Ans.

1008

1800

1764

360

252

108

46.

$10989 \div 407 = 27$, Ans.

814

2849

2849

47.

$\$1728 \times 1\frac{1}{3} = \$2304$, sold for.

$288)\$2304 = \$8$, Ans.

2304

48.

$\$5100 + \$715.80 = \$5815.80$

$\$2013 + \$1981.95 = \$3994.95$, paid.

$\$5815.80 - \$3994.95 = \$1820.85$, Ans.

49. $194 + 65 = 259$; $259 \times 7 = 1813$.

$$\frac{352 - 220}{11} = \frac{132}{11} = 12,$$

$1813 + 12 = 1825$; $1825 - 952 = 873$, Ans.

50.

$\$5.75 \times 500 = \$2875.00$, cost of flour.

$\$9.25 \times 47 = \$434.75$, " cheese.

$\$21.50 \times 15 = \$322.50$, " pork.

$\$2875.00 + \$434.75 + \$322.50 = \$3632.25$, Ans.

6475

10750

3700

2150

51.

$9212
20
$9232

$67)$9232
67
253
201
522
469
53

$137\frac{53}{67}$ hhd., Ans.

52.

2240
2000
240 lb.

125
240
5000
250
30000 lb.

Gain,

2240)30000
2240
7600
6720
880

$13\frac{880}{2240}$, Ans.

53.

$150) $2973
150
1473
1350
123

19 horses, Ans.

Ans. $123 for the carriage.

54.

$\frac{7781}{31} = 251.$

$251 + 549 = 800.$

$(2128 \div 7) \times 2 = 608.$

$800 - 608 = 192$, Ans.

55.

$194 + 65 = 259$; $259 \times 7 = 1813.$

$352 - 220 = 132$; $132 \div 11 = 12.$

$1813 + 12 = 1825.$

$91 - 35 = 56.$

$952 \div 56 = 17.$

$1825 - 17 = 1808$, Ans.

56.

$63
125
315
126
63
$7875
1368
$9243

$45.50
360
273000
13650
$16380.00
9243
$7137, Ans.

57.

150
16
900
150
2400

24|00) 408|00
24
168
168

17, Ans.

58.

18988
13
18975

25) 18975
175
147
125
225
225

759, Ans.

59.

320 5280
160 100
480 528000 ft.
2
960 ft.

96|0) 52800|0
480
480
480

550, Ans.

60. $37 + $51 = $88.

$88) $1496
88
616
616

17, Ans.

61.

$520
216) $112320
1080
432
432

$520
519
4680
520
2600
$269880, Ans.

62.

1160
2
2320
$.19
20880
2320
$440.80

11 60 lb., Ans.
$.38) $440.80
38
60
38
228
228

63.

$11 $155 $5
15 3 375
55 $465 25
11 35
$165 15
$1875

$165, cost of hay.
465, " oxen.
1875, " sheep.
$2505

$3038
2505
$533

13, Ans.
$41) $533
41
123
123

64.

$7600
2
$15200

$3775
3
$11325

$15200
11325
1500
6877
$34902

2
1
3
6 heirs.

6) $34902
$5817, Ans.

65.

$2.40
17
1680
240
$40.80

9) $40.80
$4.53⅓, Ans.

66.

160 $965 $3) $165
$5 800 55 tons.
$800 $165

160
55
Ans. 215 tons.

67.

5) 960
192
$12
384
192
$2304

3) 960
320
$15
1600
320
$4800

192
320
512 acres.

960
512
448
$20
$8960

$2304
4800
8960
$16064, sold for.
12000, cost.
Ans. $4064, gain.

Article 82.

8.

2) 84
2) 42
3) 21
7

2) 144
2) 72
2) 36
2) 18
3) 9
3

2) 160
2) 80
2) 40
2) 20
2) 10
5

2^2, 3, 7. 2^4, 3^2. 2^5, 5, Ans.

9.

2) 462
3) 231
7) 77
11

2) 576
2) 288
2) 144
2) 72
2) 36
2) 18
3) 9
3

2) 1008
2) 504
2) 252
2) 126
3) 63
3) 21
7

Ans. 2, 3, 7, 11. 2^6, 3^2. 2^4, 3^2, 7.

Article 83.

10.
2) 210
3) 105
5) 35
7

2, 3, 5, 7, Ans.

11.
2) 2772
2) 1386
3) 693
3) 231
7) 77
11

2^2, 3^2, 7, 11, Ans.

12.
2) 426
3) 213
71

2, 3, 71, Ans.

13.
3) 6105
5) 2035
11) 407
37

3, 5, 11, 37, Ans.

14.
3) 1155
5) 385
11) 77
7

3, 5, 7, 11, Ans.

15.
2) 2800
2) 1400
2) 700
2) 350
5) 175
5) 35
7

2^4, 5^2, 7, Ans

16.
2) 3420
2) 1710
3) 855
3) 285
5) 95
19

2^2, 3^2, 5, 19, Ans.

17.
2) 7800
2) 3900
2) 1950
3) 975
5) 325
5) 65
13

2^3, 3, 5^2, 13, Ans.

18.
2) 16028
2) 8014
4007

2^2, 4007, Ans.

19.
3) 17199
3) 5733
3) 1911
7) 637
7) 91
13

3^3, 7^2, 13, Ans.

20.
3) 10323
3) 3441
31) 1147
37

3^2, 31, 37, Ans.

21.
2) 12496
2) 6248
2) 3124
2) 1562
11) 781
71

2^4, 11, 71, Ans.

22.
$$\begin{array}{r|l} 2 & 1184 \\ 2 & 592 \\ 2 & 296 \\ 2 & 148 \\ 2 & 74 \\ & 37 \end{array}$$
2, 2, 2, 2, 2, 37, Ans.

23.
$$\begin{array}{r|l} 3 & 4389 \\ 7 & 1463 \\ 11 & 209 \\ & 19 \end{array}$$
3, 7, 11, 19, Ans.

24.
$$\begin{array}{r|l} 2 & 6300 \\ 2 & 3150 \\ 3 & 1575 \\ 3 & 525 \\ 5 & 175 \\ 5 & 35 \\ & 7 \end{array}$$
2, 2, 3, 3, 5, 5, 7, Ans.

25.
$$\begin{array}{r|l} 7 & 40579 \\ 11 & 5797 \\ 17 & 527 \\ & 31 \end{array}$$
7, 11, 17, 31, Ans.

Article 85.

32.
$$\frac{\overset{5}{\cancel{45}} \times \overset{5}{\cancel{20}} \times \cancel{7}}{\underset{7}{\cancel{49}} \times \cancel{4} \times \cancel{9}} = \frac{25}{7} = 3\tfrac{4}{7}, \text{ Ans.}$$

33.
$$\frac{\overset{3}{\cancel{54}} \times 3 \times \cancel{4} \times \overset{3}{\cancel{15}}}{\underset{4}{\cancel{18}} \times \underset{2}{\cancel{12}} \times \cancel{10}} = \frac{9}{2} = 4\tfrac{1}{2}, \text{ Ans.}$$

Article 86.

34.
$$\frac{\overset{3}{\cancel{51}} \quad \overset{9}{\cancel{63}} \times \cancel{4}}{\underset{68}{\underset{17}{\cancel{340}}} \times \underset{4}{\cancel{12}} \times \cancel{7}} = \frac{9}{4} = 2\tfrac{1}{4}, \text{ Ans.}$$

35.
$$\frac{\overset{3}{\cancel{18}} \times \overset{8}{\cancel{16}} \times \overset{5}{\cancel{10}} \times 5}{\underset{2}{\cancel{12}} \times \cancel{8} \times \underset{2}{\cancel{6}} \times 2} = \frac{25}{2} = 12\tfrac{1}{2}, \text{ Ans.}$$

36.
$$\frac{\overset{5}{\cancel{50}} \times \overset{4}{\cancel{36}} \times \overset{7}{\cancel{14}}}{\underset{6}{\cancel{54}} \times \cancel{10} \times \cancel{4} \times 3} = \frac{35}{9} = 3\tfrac{8}{9}, \text{ Ans.}$$

37.
$$\frac{\overset{109}{\cancel{545}} \times \overset{35}{\cancel{105}} \times 11}{\underset{3}{\cancel{35}} \times \cancel{33} \times \cancel{5}} = 109, \text{ Ans.}$$

38.
$$\frac{\overset{8}{\cancel{64}} \times \overset{3}{\cancel{63}}}{\underset{21}{\cancel{168}}} = 24, \text{ Ans.}$$

39.
$$\frac{\overset{4}{\cancel{36}} \times \overset{3}{\cancel{21}} \times \overset{7}{\cancel{14}}}{\underset{3}{\cancel{27}} \times \cancel{7} \times \underset{2}{\cancel{6}}} = \frac{28}{3} = 9\tfrac{1}{3}, \text{ Ans.}$$

40.
$$\frac{\overset{7}{\cancel{4}} \times \cancel{42}}{\underset{6}{\cancel{24}}} = 7, \text{ Ans.}$$

41.
$$\frac{\overset{5}{\cancel{120}}}{\cancel{24}} = 5 \qquad \frac{\overset{19}{\cancel{95}}}{\cancel{5}} = 19, \text{ Ans.}$$

42. $\frac{\overset{2}{\cancel{100}} \times \overset{4}{\cancel{12}}}{\underset{3}{\cancel{150}}} = 8$, Ans.

43. $\frac{\overset{5}{\cancel{225}} \times \overset{4}{\cancel{12}}}{\underset{3}{\cancel{675}}} = 4$, Ans.

44. $\frac{\overset{5}{\cancel{15}} \times \overset{6}{\cancel{30}} \times \cancel{10}}{\cancel{3} \times \underset{5}{\cancel{50}}} = \$0.30$, Ans.

Article 90.

50. $36 = 2 \times 2 \times 3 \times 3$
$81 = 3 \times 3 \times 3 \times 3$
$135 = 3 \times 3 \times 3 \times 5$

$3 \times 3 = 9$, Ans.

51. $24 = 2 \times 2 \times 2 \times 3$
$42 = 2 \times 3 \times 7$
$54 = 2 \times 3 \times 3 \times 3$
$60 = 2 \times 2 \times 3 \times 5$

$2 \times 3 = 6$, Ans.

Article 91.

52. $45 = 3 \times 3 \times 5$
$135 = 3 \times 3 \times 3 \times 5$

$3 \times 3 \times 5 = 45$, Ans.

53. $90 = 2 \times 3 \times 3 \times 5$
$105 = 3 \times 5 \times 7$

$3 \times 5 = 15$, Ans.

54 $42 = 2 \times 3 \times 7$
$81 = 3 \times 3 \times 3 \times 3$

3, Ans.

55. $132 = 2 \times 2 \times 3 \times 11$
$156 = 2 \times 2 \times 3 \times 13$

$2 \times 2 \times 3 = 12$, Ans.

56. $20 = 2 \times 2 \times 5$
$26 = 2 \times 13$
$38 = 2 \times 19$

2, Ans.

57. $32 = 2 \times 2 \times 2 \times 2 \times 2$
$48 = 2 \times 2 \times 2 \times 2 \times 3$
$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$2 \times 2 \times 2 \times 2 = 16$, Ans.

58. $45 = 3 \times 3 \times 5$
$72 = 2 \times 2 \times 2 \times 3 \times 3$
$81 = 3 \times 3 \times 3 \times 3$

$3 \times 3 = 9$, Ans.

59. $24 = 2 \times 2 \times 2 \times 3$
$51 = 3 \times 17$
$105 = 3 \times 5 \times 7$
$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$

3, Ans.

60. $12 = 2 \times 2 \times 3$
$15 = 3 \times 5$
$18 = 2 \times 3 \times 3$

3 ft., Ans.

Article 92.

62.

336) 480 (1
336
144) 336 (2
288
Greatest com. div. = 48) 144 (3
144

63.

925) 1475 (1
925
550) 925 (1
550
375) 550 (1
375
175) 375 (2
350
Greatest common divisor = 25) 175 (7
175

64.

308) 506 (1
308
198) 308 (1
198
110) 198 (1
110
88) 110 (1
88
Greatest com. div. = 22) 88 (4
88

65.

172) 1118 (6
1032
Greatest com. div. = 86) 172 (2
172

66.

275) 440 (1
275
165) 275 (1
165
110) 165 (1
110
Greatest com. div = 55) 110 (2
110

67.

2145) 3471 (1
2145
1326) 2145 (1
1326
819) 1326 (1
819
507) 819 (1
507
312) 507 (1
312
195) 312 (1
195
117) 195 (1
117
78) 117 (1
78
Greatest common divisor = 39) 78 (2
78

68.

582) 3724 (6
3492
232) 582 (2
464
118) 232 (1
118
114) 118 (1
114
4) 114 (28
112
Greatest common divisor = 2) 4 (2
4

69.

10353) 14877 (1
10353
4524) 10353 (2
9048
1305) 4524 (3
3915
609) 1305 (2
1218
Gr. com. div. = 87) 609 (7
609

70.

3528) 4424 (1
3528
896) 3528 (3
2688
840) 896 (1
840
Greatest com. div. = 56) 840 (15
840

71.

1764) 2660 (1
1764
896) 1764 (1
896
868) 896 (1
868
Gr. com. div. = 28) 868 (31
868

72.

744) 906 (1
744
162) 744 (4
648
96) 162 (1
96
66) 96 (1
66
30) 66 (2
60
Greatest common divisor = 6) 30 (5
30

73.

728) 808 (1
728
80) 728 (9
720
Greatest com. div. = 8) 80 (10
80

74.

756) 1140 (1
756
384) 756 (1
384
372) 384 (1
372
Gr. com. div. = 12) 372 (31
372

75.

2883) 3131 (1
2883
248) 2883 (11
2728
155) 248 (1
155
93) 155 (1
93
62) 93 (1
62
Greatest common divisor = 31) 62 (2
62

76.

3178) 3500 (1
3178
322) 3178 (9
2898
280) 322 (1
280
42) 280 (6
252
28) 42 (1
28
Greatest common divisor = 14) 28 (2
28

77.

4872) 9048 (1
4872
4176) 4872 (1
4176
Gr. com. div. = 696) 4176 (6
4176

Article 96.

83. $7 = 1 \times 7$
$14 = 2 \times 7$
$15 = 3 \times 5$
$21 = 3 \times 7$

$2 \times 3 \times 5 \times 7 = 210$, Ans.

84. $18 = 2 \times 3 \times 3$
$28 = 2 \times 2 \times 7$
$30 = 2 \times 3 \times 5$
$42 = 2 \times 3 \times 7$

$2 \times 2 \times 3 \times 3 \times 5 \times 7 = 1260$, Ans.

Article 97.

85. $21 = 3 \times 7$
$33 = 3 \times 11$
$56 = 2 \times 2 \times 2 \times 7$

$2 \times 2 \times 2 \times 3 \times 7 \times 11 = 1848$, Ans.

86. $63 = 3 \times 3 \times 7$
$72 = 2 \times 2 \times 2 \times 3 \times 3$
$84 = 2 \times 2 \times 3 \times 7$

$2 \times 2 \times 2 \times 3 \times 3 \times 7 = 504$, Ans.

87. $66 = 2 \times 3 \times 11$
$88 = 2 \times 2 \times 2 \times 11$
$110 = 2 \times 5 \times 11$

$2 \times 2 \times 2 \times 3 \times 5 \times 11 = 1320$, Ans.

88. $81 = 3 \times 3 \times 3 \times 3$
$63 = 3 \times 3 \times 7$
$135 = 3 \times 3 \times 3 \times 5$

$3 \times 3 \times 3 \times 3 \times 5 \times 7 = 2835$, Ans.

89. $8 = 2 \times 2 \times 2$
$18 = 2 \times 3 \times 3$
$24 = 2 \times 2 \times 2 \times 3$
$36 = 2 \times 2 \times 3 \times 3$

$2 \times 2 \times 2 \times 3 \times 3 = 72$, Ans.

90. $7 = 1 \times 7$
$25 = 5 \times 5$
$12 = 2 \times 2 \times 3$
$41 = 1 \times 41$

$2 \times 2 \times 3 \times 5 \times 5 \times 7 \times 41 = 86100$, Ans.

91. $28 = 2 \times 2 \times 7$
$56 = 2 \times 2 \times 2 \times 7$
$100 = 2 \times 2 \times 5 \times 5$
$125 = 5 \times 5 \times 5$

$2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 7 = 7000$, Ans.

92. $24 = 2 \times 2 \times 2 \times 3$
$42 = 2 \times 3 \times 7$
$54 = 2 \times 3 \times 3 \times 3$
$180 = 2 \times 2 \times 3 \times 3 \times 5$

$2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 7560$, Ans.

93. $24 = 2 \times 2 \times 2 \times 3$
$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$
$100 = 2 \times 2 \times 5 \times 5$
$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$
$2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 =$ 7200, Ans.

94. $4 = 2 \times 2$
$11 = 1 \times 11$
$18 = 2 \times 3 \times 3$
$20 = 2 \times 2 \times 5$
$36 = 2 \times 2 \times 3 \times 3$
$48 = 2 \times 2 \times 2 \times 2 \times 3$
$2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 11 =$ 7920, Ans.

95. $5 = 1 \times 5$
$35 = 5 \times 7$
$50 = 2 \times 5 \times 5$
$2 \times 5 \times 5 \times 7 = 350$, Ans.

MISCELLANEOUS EXERCISES.

96.

2) 2520
2) 1260
2) 630
3) 315
3) 105
5) 35
7

$2^3, 3^2, 5, 7$, Ans.

97.

2) 5760
2) 2880
2) 1440
2) 720
2) 360
2) 180
2) 90
3) 45
3) 15
5

$2^7, 3^2$, Ans.

98.

689) 1573 (2
1378
195) 689 (3
585
104) 195 (1
104
91) 104 (1
91
Greatest common divisor = 13) 91 (7
91

99.

71
73
79
83
89
97
492, Ans.

100.

$$\frac{\overset{2}{\cancel{14}} \times \cancel{15} \times \overset{2}{\cancel{16}} \times \overset{3}{\cancel{24}} \times \overset{8}{\cancel{48}} \times \overset{5}{\cancel{60}}}{\cancel{7} \times \overset{2}{\cancel{30}} \times \cancel{8} \times \cancel{8} \times \cancel{6} \times \cancel{12} \times \cancel{3}} = 80, \text{ Ans.}$$

101. $48 = 2 \times 2 \times 2 \times 2 \times 3$

$36 = 2 \times 2 \times 3 \times 3$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$24 = 2 \times 2 \times 2 \times 3$

$2 \times 2 \times 3 = 12$, Greatest common divisor.

$2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$, Least common multiple.

$12 \overline{)144} \ (12$, Ans.

144

102.

100

102

104

105

106

108

110

111

112

114

103. $160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$

$352 = 2 \times 2 \times 2 \times 2 \times 2 \times 11$

$992 = 2 \times 2 \times 2 \times 2 \times 2 \times 31$

$2 \times 2 \times 2 \times 2 \times 2 = 32$, Greatest common divisor.

$2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 11 \times 31 = 54560$,

Least common multiple.

115

116

117

118

119

120

$\overline{1777}$, Ans.

54560

32

$\overline{54528}$, Ans.

104. $168 = 2 \times 2 \times 2 \times 3 \times 7$

$1008 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$

$$\frac{\cancel{2} \times \cancel{2} \times \cancel{2} \times 2 \times \cancel{3} \times 3 \times \cancel{7}}{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{3} \times \cancel{7}} = 6, \text{ Ans.}$$

105.

$$\frac{\overset{3}{\cancel{24}} \times 35}{\cancel{8}} = 105, \text{ Ans.}$$

Article 111.

34. $\frac{30}{75}$.

Article 112.

35. $\frac{36}{84}$.

36. $\frac{24}{32}$.

37. $\frac{24}{84}$.

38. $\frac{182}{196}$.

39. $\frac{120}{168}$.

40. $\frac{171}{189}$.

41. $\frac{26}{42}$.

42. $\frac{360}{576}$.

Article 114.

53. $\frac{3}{4}$.

54. $\frac{5}{8}$.

Article 115.

55. $\frac{9}{10}$.

56. $\frac{7}{19}$.

57. $\frac{3}{35}$.

58. $\frac{25}{16}$.

59. $\frac{374}{361}$.

60. $\frac{28}{37}$.

61. $\frac{8}{9}$.

62. $\frac{4}{5}$.

63. $\frac{107}{117}$.

64. $\frac{11}{19}$.

65. $\frac{22}{125}$.

66. $\frac{31}{11}$.

67. $\frac{18}{87}$.

68. $\frac{13}{17}$.

69. $\frac{81}{423}$.

70. $\frac{18}{87}$.

80. $\frac{187}{1}$.

82. $\frac{3568}{13}$.

83. $\frac{510}{11}$.

Article 116.

84. $\frac{1385}{15}$; $\frac{2347}{21}$.

85. $\frac{1485}{13}$.

86. $\frac{147}{16}$.

87. $\frac{1067}{19}$.

88. $\frac{733}{7}$.

89. $\frac{618}{153}$.

90. $\frac{104}{13}$.

91. $\frac{2554}{87}$.

92. $\frac{75}{19}$.

93. $\frac{1000}{7}$.

94. $\frac{4861}{60}$.

95. $\frac{63011}{274}$.

96. $\frac{2147}{14}$.

97. $\frac{1730100}{1000}$.

105. 43.

106. $63\frac{48}{71}$.

Article 117.

107. 9.

108. $27\frac{2}{5}$.

109. $169\frac{5}{19}$.

110. 1.

111. $1\frac{108}{858}$.

112. $1\frac{5}{19}$.

113. $7\frac{13}{17}$.

114. 128.

115. $119\frac{33}{81}$.

116. $4\frac{12}{489}$.

117. $9\frac{4}{29}$.

118. $90\frac{10}{11}$.

119. $91\frac{28}{45}$.

120. $100\frac{10}{111}$.

121. $95\frac{2354}{3007}$.

Article 120.

131. $\frac{48}{56}$, $\frac{49}{56}$.

133. $\frac{96}{120}$, $\frac{100}{120}$, $\frac{75}{120}$.

134. $\frac{27}{36}$, $\frac{28}{36}$, $\frac{33}{36}$.

Article 121.

135. $\frac{10}{45}$, $\frac{21}{45}$.

136. $\frac{30}{91}$, $\frac{28}{91}$.

137. $\frac{63}{108}$, $\frac{124}{108}$.

138. $\frac{125}{1200}$, $\frac{144}{1200}$.

139. $\frac{18}{84}$, $\frac{32}{84}$, $\frac{27}{84}$.

140. $\frac{105}{128}$, $\frac{70}{128}$, $\frac{72}{128}$.

141. $\frac{40}{105}$, $\frac{50}{105}$, $\frac{63}{105}$.

142. $\frac{15}{8}$, $\frac{4}{8}$, $\frac{96}{8}$.

143. $\frac{297}{2475}$, $\frac{935}{2475}$, $\frac{675}{2475}$, $\frac{99}{2475}$.

144. $\frac{700}{1000}$, $\frac{70}{1000}$, $\frac{7}{1000}$, $\frac{7000}{1000}$.

145. $\frac{186}{24}$, $\frac{0}{24}$, $\frac{20}{24}$, $\frac{14}{24}$.

146. $\frac{35}{40}$, $\frac{38}{40}$, $\frac{30}{40}$.

147. $\frac{20}{45}$, $\frac{27}{45}$, $\frac{24}{45}$.

Article 123.

156. $\frac{5}{8}+\frac{11}{12}+\frac{13}{16}=\frac{30}{48}+\frac{44}{48}+\frac{39}{48}=\frac{113}{48}=2\frac{17}{48}$, Ans.

157.

$\frac{5}{14}+\frac{11}{18}+\frac{9}{20}=\frac{450}{1260}+\frac{770}{1260}+\frac{567}{1260}=\frac{1787}{1260}=1\frac{527}{1260}$, Ans.

Article 124.

158. $\frac{4}{9}+\frac{5}{14}+\frac{5}{42}=\frac{56}{126}+\frac{45}{126}+\frac{15}{126}=\frac{116}{126}=\frac{58}{63}$, Ans.

159. $\frac{15}{21}+\frac{11}{21}+\frac{17}{21}=\frac{43}{21}=2\frac{1}{21}$, Ans.

160. $\frac{23}{24}+\frac{61}{96}=\frac{92}{96}+\frac{61}{96}=\frac{153}{96}=1\frac{19}{32}$, Ans.

161.

$\frac{9}{7}+\frac{6}{11}+\frac{8}{14}=\frac{198}{154}+\frac{84}{154}+\frac{88}{154}=\frac{370}{154}=2\frac{62}{154}=2\frac{31}{77}$, Ans.

162. $\frac{5}{17} + \frac{7}{51} + \frac{9}{68} = \frac{60}{204} + \frac{28}{204} + \frac{27}{204} = \frac{115}{204}$, Ans.

163. $\frac{31}{6} + \frac{7}{9} + \frac{61}{24} = \frac{372}{72} + \frac{56}{72} + \frac{183}{72} = \frac{611}{72} = 8\frac{35}{72}$, Ans.

164. $\frac{7}{8} + \frac{3}{10} + \frac{11}{10} + \frac{7}{18} = \frac{315}{360} + \frac{108}{360} + \frac{396}{360} + \frac{140}{360} = \frac{959}{360} =$

$2\frac{239}{360}$, Ans.

165. $\frac{3}{25} + \frac{49}{50} + \frac{74}{75} + \frac{81}{100} = \frac{36}{300} + \frac{294}{300} + \frac{296}{300} + \frac{243}{300} = \frac{869}{300}$

$= 2\frac{269}{300}$, Ans.

166. $\frac{2}{5} + \frac{23}{36} + \frac{17}{9} + \frac{7}{1} = \frac{72}{180} + \frac{115}{180} + \frac{340}{180} + \frac{1260}{180} = \frac{1787}{180}$

$= 9\frac{167}{180}$, Ans.

Article 125.

167.

$15\frac{3}{4}$
$24\frac{5}{8}$
39
$1\frac{3}{8}$
$40\frac{3}{8}$, Ans.

$\frac{3}{4} + \frac{5}{8} =$
$\frac{6}{8} + \frac{5}{8} =$
$\frac{11}{8} = 1\frac{3}{8}$

168.

$37\frac{5}{6}$
$109\frac{2}{7}$
$341\frac{8}{21}$
487
$488\frac{1}{2}$, Ans.

$\frac{5}{6} + \frac{2}{7} + \frac{8}{21} =$
$\frac{35}{42} + \frac{12}{42} + \frac{16}{42} =$
$\frac{63}{42} = 1\frac{21}{42} = 1\frac{1}{2}$

169.

$\$ 4\frac{3}{4}$
$16\frac{1}{2}$
$5\frac{7}{8}$
$\$ 25$
$\$ 27\frac{1}{8}$, Ans.

$\frac{3}{4} + \frac{1}{2} + \frac{7}{8} =$
$\frac{6}{8} + \frac{4}{8} + \frac{7}{8} =$
$\frac{17}{8} = 2\frac{1}{8}$

170.

$160\frac{3}{4}$
$67\frac{5}{16}$
$85\frac{7}{20}$
312
$313\frac{33}{80}$, Ans.

$\frac{3}{4} + \frac{5}{16} + \frac{7}{20} =$
$\frac{60}{80} + \frac{25}{80} + \frac{28}{80} =$
$\frac{113}{80} = 1\frac{33}{80}$

Article 126.

182. $\frac{21}{24} - \frac{31}{42} = \frac{147}{168} - \frac{124}{168} = \frac{23}{168}$, Ans.

183. $\frac{29}{30} - \frac{23}{30} = \frac{6}{30} = \frac{1}{5}$, Ans.

184. $\frac{17}{42} - \frac{3}{14} = \frac{17}{42} - \frac{9}{42} = \frac{8}{42} = \frac{4}{21}$, Ans.

Article 127.

185. $\frac{17}{24} - \frac{7}{20} = \frac{85}{120} - \frac{42}{120} = \frac{43}{120}$, Ans.

186. $\frac{11}{34} - \frac{1}{10} = \frac{110}{340} - \frac{34}{340} = \frac{76}{340} = \frac{19}{85}$, Ans.

187. $\frac{31}{36} - \frac{9}{16} = \frac{124}{144} - \frac{81}{144} = \frac{43}{144}$, Ans.

188. $\frac{167}{711} - \frac{19}{711} = \frac{148}{711}$, Ans.

189. $\frac{48}{68} = \frac{12}{17}$; $\frac{37}{51} - \frac{12}{17} = \frac{37}{51} - \frac{36}{51} = \frac{1}{51}$, Ans.

190. $\frac{97}{100} - \frac{17}{100} = \frac{80}{100} = \frac{4}{5}$, Ans.

191. $\frac{1}{10} - \frac{19}{1000} = \frac{100}{1000} - \frac{19}{1000} = \frac{81}{1000}$, Ans.

192. $\frac{41}{34} - \frac{17}{17} = \frac{41}{34} - \frac{34}{34} = \frac{7}{34}$, Ans.

193. $\frac{43}{216} - \frac{19}{96} = \frac{172}{864} - \frac{171}{864} = \frac{1}{864}$, Ans.

194. $\frac{15}{30} - \frac{15}{31} = \frac{465}{930} - \frac{450}{930} = \frac{15}{930} = \frac{1}{62}$, Ans.

196.

$31\frac{3}{4} = 31\frac{27}{36}$
$10\frac{1}{9} = 10\frac{4}{36}$
$21\frac{23}{36}$, Ans.

197.

$63 = 62\frac{13}{12}$
$54\frac{7}{12} = 54\frac{7}{12}$
$8\frac{6}{12}$, Ans.

198.

$73\frac{9}{10} = 73\frac{18}{20}$
$67\frac{1}{100} = 67\frac{1}{20}$
$6\frac{17}{20}$, Ans.

199.

$29\frac{18}{19} = 29\frac{162}{171}$
$16\frac{8}{9} = 16\frac{152}{171}$
$13\frac{67}{171}$, Ans.

200.

$311 = 310\frac{81}{81}$
$30\frac{19}{81} = 30\frac{19}{81}$
$280\frac{62}{81}$, Ans.

201.

$103\frac{105}{108} = 103\frac{840}{864}$
$99\frac{77}{96} = 99\frac{693}{864}$
$4\frac{147}{864} = 4\frac{49}{288}$, Ans.

202.

$\$7\frac{5}{8} = \$7\frac{15}{24} = \$6\frac{39}{24}$
$\$1\frac{5}{8} = 1\frac{29}{24}$
$\$5\frac{19}{24}$, Ans.

203.

$150 = 149\frac{40}{40}$
$147\frac{17}{40} = 147\frac{17}{40}$
$2\frac{23}{40}$, Ans.

204.

$19\frac{5}{8} = 19\frac{25}{40}$
$17\frac{3}{20} = 17\frac{6}{40}$
$2\frac{19}{40}$, Ans.

Article 128.

212. $1\frac{5}{8}$.
213. $15\frac{1}{3}$.
214. $37\frac{13}{31}$.
215. 49.
216. $10\frac{11}{12}$.
217 $2\frac{86}{101}$.
218. $43\frac{1}{2}$.
219. 144.

221.

$\frac{7}{18} \times \frac{3}{27} = \frac{21}{2} = 10\frac{1}{2}$
$40 \times 27 = 1080$
$1090\frac{1}{2}$, Ans.

222.

$\frac{4}{9} \times \frac{7}{63} = 28$
$81 \times 63 = 5103$
5131, Ans.

223. $\frac{3}{\cancel{10}\cancel{5}} \times \overset{5}{\cancel{75}} = \frac{15}{7} = 2\frac{1}{7}$

$39 \times 75 = 2925$

$2927\frac{1}{7}$, Ans.

224. $\frac{5}{\cancel{16}} \times \overset{5}{\cancel{80}} = 25$

$125 \times 80 = 10000$

10025, Ans.

225. $\frac{5}{\cancel{8}} \times \overset{9}{\cancel{72}} = \$45$

$8 \times 72 = 576$

$\$621$, Ans.

Article 129.

232. 84.

233. $24\frac{13}{18}$.

234. 325.

235. $97\frac{3}{7}$.

236. 88.

237. $165\frac{6}{13}$.

238. $17\frac{5}{11}$.

239. $243\frac{5}{17}$.

241.

$\overset{55}{\cancel{110}} \times \frac{3}{\cancel{4}_{2}} = \frac{165}{2} = 82\frac{1}{2}$

$110 \times 9 = 990$

$1072\frac{1}{2}$, Ans.

242.

$85 \times \frac{1}{6} = \frac{85}{6} = 14\frac{1}{6}$

$85 \times 13 = 1105$

$1119\frac{1}{6}$, Ans.

243.

$\overset{7}{\cancel{84}} \times \frac{5}{\cancel{12}} = 35$

$84 \times 9 = 756$

791, Ans.

244.

$145 \times \frac{6}{7} = \frac{870}{7} = 124\frac{2}{7}$

$145 \times 11 = 1595$

$1719\frac{2}{7}$, Ans.

245. $\overset{25}{\cancel{50}} \times \frac{5}{\cancel{8}_{4}} = \frac{125}{4} = 31\frac{1}{4}$

$50 \times 25 = 1250$

$1281\frac{1}{4}$, Ans.

Article 130.

256. $\frac{\overset{3}{\cancel{18}}}{19} \times \frac{11}{\underset{2}{\cancel{12}}} = \frac{33}{38}$, Ans. $\quad \frac{\overset{3}{\cancel{15}}}{\underset{3}{\cancel{36}}} \times \frac{\overset{2}{\cancel{24}}}{\underset{5}{\cancel{25}}} = \frac{2}{5}$, Ans.

Article 131.

257. $\frac{35}{\underset{8}{\cancel{72}}} \times \frac{\overset{3}{\cancel{27}}}{1} = \frac{105}{8} = 13\frac{1}{8}$, Ans. 258. $\frac{\overset{4}{\cancel{36}}}{\underset{5}{\cancel{55}}} \times \frac{\overset{4}{\cancel{52}}}{\underset{11}{\cancel{99}}} = \frac{16}{55}$, Ans.

259.

$\frac{\overset{89}{\cancel{267}}}{\underset{100}{\cancel{300}}} \times \frac{7}{5} = \frac{623}{500} = 1\frac{123}{500}$, Ans.

260.

$\frac{7}{9} \times \frac{2}{3}$ of $\frac{\overset{2}{\cancel{6}}}{11} = \frac{28}{99}$, Ans.

261.

$\frac{\overset{12}{\cancel{48}}}{5} \times \frac{4}{\underset{4}{\cancel{8}}}$ of $\frac{\underset{4}{\cancel{16}}}{5} = \frac{12}{5} = 2\frac{2}{5}$, Ans.

262.

$\frac{\underset{5}{\cancel{35}}}{17} \times \frac{1}{7}$ of $\frac{\overset{3}{\cancel{51}}}{\underset{2}{\cancel{70}}} = \frac{3}{14}$, Ans.

263.

$\frac{\overset{2}{\cancel{8}}}{\underset{4}{\cancel{4}}}$ of $\frac{8}{9}$ of $\frac{10}{\underset{3}{\cancel{3}}} = \frac{20}{9} = 2\frac{2}{9}$, Ans.

264.

$\frac{3}{\underset{4}{\cancel{4}}} \times \frac{\underset{5}{\cancel{5}}}{\underset{6}{\cancel{6}}} \times \frac{\underset{6}{\cancel{6}}}{7} = \frac{3}{7}$, Ans.

265. $7\frac{1}{6} = \frac{47}{6}$, $11\frac{3}{8} = \frac{91}{8}$; $\frac{91}{8} \times \frac{47}{6} = \frac{4277}{48} = \$89\frac{5}{48}$, Ans.

266. $\frac{11}{5}$ of $\frac{7}{\underset{2}{\cancel{2}}} \times \frac{8}{\underset{5}{\cancel{5}}} \times \frac{2}{3}$ of $\frac{\overset{2}{\cancel{10}}}{1} = \frac{1232}{15} = 82\frac{2}{15}$, Ans.

267. $\frac{\underset{3}{\cancel{3}}}{\underset{9}{\cancel{9}}}$ of $\frac{4}{7}$ of $\frac{\underset{9}{\cancel{9}}}{11} \times \frac{2}{\underset{3}{\cancel{3}}}$ of $\frac{18}{1} = \frac{144}{77} = 1\frac{67}{77}$, Ans.

268.

$$8\tfrac{3}{10} = \frac{83}{10},\ 9\tfrac{1}{4} = \frac{37}{4};\ \frac{\cancel{4}^{2}}{7} \text{ of } \frac{83}{\cancel{10}_{5}} \times \frac{\cancel{4}^{2}}{7} \text{ of } \frac{37}{\cancel{4}} = \frac{6142}{245} = 25\tfrac{117}{245},\ \text{Ans.}$$

269.

$$5\tfrac{7}{10} = \frac{57}{10},\ 21\tfrac{9}{16} = \frac{345}{16};\ \frac{\cancel{345}^{69}}{16} \times \frac{57}{\cancel{10}_{2}} = \frac{3933}{32} = \$\,122\tfrac{29}{32},\ \text{Ans.}$$

270.

$$4\tfrac{9}{10} = \frac{49}{10},\ 3\tfrac{7}{12} = \frac{43}{12};\ \frac{\cancel{3}}{4} \text{ of } \frac{43}{\cancel{12}_{4}} \times \frac{49}{10} = \frac{2107}{160} = 13\tfrac{27}{160},\ \text{Ans.}$$

Article 132.

282. $\frac{7}{228}$.	**289.** $\frac{6}{533}$.	**305.** $29\frac{5}{11}$.	**311.** 162.
283. $\frac{4}{343}$.	**291.** $\frac{3}{40}$.	**306.** $87\frac{1}{2}$.	**312.** $111\frac{13}{17}$.
284. $\frac{3}{517}$.	**292.** $15\frac{27}{70}$.	**307.** $52\frac{1}{2}$.	**313.** $21\frac{11}{43}$.
285. $\frac{5}{316}$.	**293.** $3\frac{17}{45}$.	**308.** 170.	**314.** 64.
286. $\frac{67}{5480}$.	**294.** $\$\,6\frac{3}{8}$.	**309.** $151\frac{5}{11}$.	**315.** 16.
287. $\frac{4}{97}$.	**304.** $88\frac{13}{18}$.	**310.** 40.	**316.** 7.
288. $\frac{1}{855}$.			

327. $\frac{7}{9} \div \frac{4}{7} = \frac{7}{9} \times \frac{7}{4} = \frac{49}{36} = 1\frac{13}{36}$, Ans.

328. $\frac{12}{25} \div \frac{9}{10} = \frac{\cancel{12}^{4}}{\cancel{25}_{5}} \times \frac{\cancel{10}^{2}}{\cancel{9}_{3}} = \frac{8}{15}$, Ans.

Article 133.

329. $\frac{25}{39} \div \frac{10}{13} = \frac{\overset{5}{\cancel{25}}}{\underset{3}{\cancel{39}}} \times \frac{\cancel{13}}{\underset{2}{\cancel{10}}} = \frac{5}{6}$, Ans.

330. $\frac{12}{49} \div \frac{3}{7} = \frac{\overset{4}{\cancel{12}}}{\underset{7}{\cancel{49}}} \times \frac{\cancel{7}}{\cancel{3}} = \frac{4}{7}$, Ans.

331. $\frac{11}{12} \div \frac{47}{56} = \frac{11}{\underset{3}{\cancel{12}}} \times \frac{\overset{14}{\cancel{56}}}{47} = \frac{154}{141} = 1\frac{13}{141}$, Ans.

332. $\frac{17}{20} \div \frac{3}{5} = \frac{17}{\underset{4}{\cancel{20}}} \times \frac{\cancel{5}}{3} = \frac{17}{12} = 1\frac{5}{12}$, Ans.

333. $\frac{38}{275} \div \frac{133}{385} = \frac{\overset{2}{\cancel{38}}}{\underset{5}{\cancel{275}}} \times \frac{\overset{7}{\cancel{385}}}{\underset{7}{\cancel{133}}} = \frac{2}{5}$, Ans.

334. $\frac{41}{33} \div \frac{63}{11} = \frac{41}{\underset{3}{\cancel{33}}} \times \frac{\cancel{11}}{63} = \frac{41}{189}$, Ans.

335. $9\frac{3}{8} \div 4\frac{1}{2} = \frac{\overset{25}{\cancel{75}}}{\underset{4}{\cancel{8}}} \times \frac{\cancel{2}}{\underset{3}{\cancel{9}}} = \frac{25}{12} = 2\frac{1}{12}$, Ans.

336. $\frac{208}{135} \div \frac{130}{441} = \frac{\overset{104}{\cancel{208}}}{\underset{15}{\cancel{135}}} \times \frac{\overset{49}{\cancel{441}}}{\underset{65}{\cancel{130}}} = \frac{5096}{975} = 5\frac{221}{975}$, Ans.

337. $17\frac{8}{21} \div 5\frac{5}{6} = \frac{\overset{73}{\cancel{365}}}{\underset{7}{\cancel{21}}} \times \frac{\overset{2}{\cancel{6}}}{\underset{7}{\cancel{35}}} = \frac{146}{49} = 2\frac{48}{49}$, Ans.

338. $100\frac{5}{8} \div 8\frac{3}{5} = \frac{905}{9} \times \frac{5}{26} = \frac{905}{78} = 11\frac{77}{78}$, Ans.

339. $\frac{14}{25} \div \frac{14}{16} = \frac{14}{25} \times \frac{16}{14} = \frac{16}{25}$, Ans.

340. $11\frac{1}{4} = \frac{45}{4}$; $\frac{45}{4} \div \frac{5}{8} = \frac{45}{4} \times \frac{8}{5} = 18$, Ans.

341.

$15\frac{3}{10} = \frac{153}{10}$, $3\frac{3}{5} = \frac{18}{5}$; $\frac{153}{10} \div \frac{18}{5} = \frac{153}{10} \times \frac{5}{18} = \frac{17}{4} = 4\frac{1}{4}$, Ans.

343. $\frac{9}{\frac{13}{5}} = \frac{9}{13} \div \frac{2}{5} = \frac{9}{13} \times \frac{5}{2} = \frac{45}{26} = 1\frac{19}{26}$, Ans.

344. $\frac{12}{\frac{1}{5}} = \frac{12}{1} \div \frac{5}{8} = \frac{12}{1} \times \frac{8}{5} = \frac{96}{5} = 19\frac{1}{5}$, Ans.

345. $\frac{6\frac{3}{7}}{\frac{3}{8}} = \frac{44}{7} \div \frac{3}{8} = \frac{44}{7} \times \frac{8}{3} = \frac{352}{21} = 16\frac{16}{21}$, Ans.

346. $\frac{5\frac{1}{2}}{11} = \frac{11}{2} \div \frac{11}{1} = \frac{11}{2} \times \frac{1}{11} = \frac{1}{2}$, Ans.

347. $\frac{19}{2\frac{4}{11}} = \frac{19}{1} \div \frac{26}{11} = \frac{19}{1} \times \frac{11}{26} = \frac{209}{26} = 8\frac{1}{26}$, Ans.

348. $\frac{6\frac{2}{3}}{8\frac{2}{3}} = \frac{20}{3} \div \frac{53}{6} = \frac{20}{3} \times \frac{6}{53} = \frac{40}{53}$, Ans.

349. $\frac{10\frac{5}{7}}{83\frac{1}{4}} = \frac{75}{7} \div \frac{333}{4} = \frac{75}{7} \times \frac{4}{333} = \frac{100}{777}$, Ans.

350. $23\frac{3}{4} = \frac{95}{4}$; $\frac{95}{4} \div \frac{19}{36} = \frac{\overset{5}{\cancel{95}}}{\cancel{4}} \times \frac{\overset{9}{\cancel{36}}}{\cancel{19}} = 45$, Ans.

351.

$31\frac{6}{14} = \frac{440}{14}$, $125\frac{5}{7} = \frac{880}{7}$; $\frac{880}{7} \div \frac{440}{14} = \frac{\overset{2}{\cancel{880}}}{\cancel{7}} \times \frac{\overset{2}{\cancel{14}}}{\cancel{440}} = 4$, Ans.

Article 134.

359. $\frac{3}{5}$.

360. $\frac{6}{7}$.

361. $\frac{5}{7}$.

362. $\frac{1}{2}$.

363. $\frac{1}{6}$.

364. $\frac{5}{7}$.

365. $\frac{6}{7}$.

366. $1\frac{5}{16}$.

367. $1\frac{3}{4}$.

368. $1\frac{2}{5}$.

369. $\frac{6}{17}$.

370. 112.

371. \$ 52.50.

372. $\frac{53}{78}$.

373. $\frac{3}{5}$.

374. $\$\ 4\frac{97}{100}$.

388. $\frac{\overset{39}{\cancel{351}}}{\cancel{9}} \times 25 = 975$, Ans.

Article 135.

389. $\frac{\overset{152}{\cancel{1368}}}{\cancel{9}} \times 11 = 1672$, Ans.

390. $\frac{\overset{81}{\cancel{891}}}{\cancel{11}} \times 23 = 1863$, Ans.

391. $\frac{\overset{1600}{\cancel{8000}}}{\underset{5}{\cancel{125}}} \times \overset{4}{\cancel{100}} = 6400$, Ans.

392. $\frac{\overset{13}{\cancel{273}}}{\cancel{21}} \times 50 = 650$; $\frac{4}{5}$ of $\overset{130}{\cancel{650}} = 520$, Ans.

393. $\frac{\overset{200}{\cancel{1600}}}{\cancel{8}} \times 15 = 3000$; \$ 3000 — \$ 1600 = \$ 1400, Ans.

394. $\frac{12}{17}$ of $\overset{20}{\cancel{340}} = 240$; $\frac{\overset{30}{\cancel{240}}}{\cancel{8}} \times 11 = 330$, Ans.

395. $\frac{3}{5} \div \frac{9}{10} = \frac{\cancel{3}}{\cancel{5}} \times \frac{\overset{2}{\cancel{10}}}{\underset{3}{\cancel{9}}} = \frac{2}{3}$, Ans.

396. $7\frac{1}{2} = \frac{15}{2}$; $\frac{15}{2} \div \frac{5}{17} = \frac{\overset{3}{\cancel{15}}}{2} \times \frac{17}{\cancel{5}} = \frac{51}{2} = 25\frac{1}{2}$, Ans.

397. $\frac{7}{7} - \frac{3}{7} = \frac{4}{7}$; $\frac{\overset{231}{\cancel{462}}}{\underset{2}{\cancel{4}}} \times 7 = \frac{1617}{2} = \$808\frac{1}{2}$, Ans.

398. $\frac{\overset{1310}{\cancel{3930}}}{\cancel{3}} \times 5 = \$6550$, Ans.

399. $1\frac{5}{16} = \frac{21}{16}$; $\frac{\overset{125}{\cancel{2000}}}{\cancel{16}} \times 21 = \$2625$, Ans.

400. $\frac{9}{9} + \frac{2}{9} = \frac{11}{9}$; $\frac{\overset{991}{\cancel{10901}}}{\cancel{11}} \times 9 = \$8919$, Ans.

MISCELLANEOUS EXERCISES.

401. $43\frac{1}{2} = \frac{87}{2}$; $\frac{87}{2} \div \frac{5}{6} = \frac{87}{\cancel{2}} \times \frac{\overset{3}{\cancel{6}}}{5} = \frac{261}{5} = 52\frac{1}{5}$, Ans.

402. $2\frac{1}{2} = \frac{5}{2}$; $\frac{15}{16} \div \frac{5}{2} = \frac{\overset{3}{\cancel{15}}}{\underset{8}{\cancel{16}}} \times \frac{\cancel{2}}{\cancel{5}} = \$\frac{3}{8}$, Ans.

403. $12 \times \frac{3}{4} \div \frac{4}{5} = \overset{3}{\cancel{12}} \times \frac{3}{\cancel{4}} \times \frac{5}{4} = \frac{45}{4} = 11\frac{1}{4}$, Ans.

404. $\frac{\overset{.80}{\cancel{5.60}}}{\cancel{7}} \times 8 = \$6.40$, Ans.

405.

$$\frac{\cancel{7}}{\cancel{11}} \text{ of } 12\tfrac{1}{2} = \frac{7}{8} \times \frac{11}{3} \times \frac{25}{2} = \frac{1925}{48}; \quad \frac{\cancel{1}}{7\frac{1}{2}} \text{ of } 8\tfrac{3}{4} = \frac{1}{3} \times \frac{\cancel{2}}{\cancel{15}} \times \frac{\overset{7}{\cancel{35}}}{\cancel{4}} = \frac{7}{18}$$

$$\frac{1925}{48} \div \frac{7}{18} = \frac{\overset{275}{\cancel{1925}}}{\cancel{48}} \times \frac{\overset{3}{\cancel{18}}}{\cancel{7}} = \frac{825}{8} = 103\tfrac{1}{8}, \text{ Ans.}$$

406. $20 \div 7\frac{3}{8} = 20 \times \frac{8}{59} = \frac{160}{59} = 2\frac{42}{59}$, Ans.

407. $60 \div \frac{9}{11} = \overset{20}{\cancel{60}} \times \frac{11}{\cancel{9}} = \frac{220}{3} = 73\frac{1}{3}$, Ans.

408. $106\frac{7}{9} \div 8 = \frac{961}{9} \times \frac{1}{8} = \frac{961}{72} = \$13\frac{25}{72}$, Ans.

409. $\$350 - \$125 = \$225$; $\frac{225}{350} = \frac{9}{14}$, Ans.

410. $19 \div 2\frac{3}{7} = 19 \times \frac{7}{17} = \frac{133}{17} = 7\frac{14}{17}$ pieces, Ans.

$\frac{14}{17}$ of $2\frac{3}{7}$ ft. $= 2$ ft., Ans.

411. $\$67\frac{1}{2} \div 10\frac{1}{8} = \frac{\overset{5}{\cancel{135}}}{\cancel{2}} \times \frac{\overset{4}{\cancel{8}}}{\cancel{81}} = \frac{20}{3} = \$6\frac{2}{3}$, Ans.

412. $\frac{21}{27} = \frac{7}{9}$, $\frac{14}{18} = \frac{7}{9}$; $\frac{7}{9} \div \frac{7}{9} = \frac{\overset{1}{\cancel{7}}}{\underset{1}{\cancel{9}}} \times \frac{\cancel{9}}{\cancel{7}} = 1$, Ans.

413. $\frac{\overset{2}{\cancel{14}}}{\cancel{8}}$ of $\frac{\overset{12}{\cancel{84}}}{\cancel{7}} \times \frac{8}{1} = 192$; $28\frac{1}{2} \div 7\frac{1}{8} = \frac{\cancel{57}}{\cancel{2}} \times \frac{\overset{4}{\cancel{8}}}{\cancel{57}} = 4$

$$\frac{192}{4} = 48, \text{ Ans.}$$

414. $4\frac{1}{5} \div 2\frac{1}{3} = \frac{\overset{3}{\cancel{21}}}{5} \times \frac{3}{\cancel{7}} = \frac{9}{5} = 1\frac{4}{5}$, Ans.

415. $\frac{1}{9}$ of $1\frac{1}{4} \times 4\frac{1}{2} = \frac{1}{\cancel{9}} \times \frac{5}{4} \times \frac{\cancel{9}}{2} = \frac{5}{8}$

$\frac{5}{56}$ of $1\frac{1}{3} \times 3\frac{1}{2} = \frac{5}{\underset{2}{\cancel{56}}} \times \frac{\overset{4}{\cancel{8}}}{3} \times \frac{\cancel{7}}{2} = \frac{5}{12}$

$$\frac{5}{8} \div \frac{5}{12} = \frac{\cancel{5}}{\underset{2}{\cancel{8}}} \times \frac{\overset{3}{\cancel{12}}}{\cancel{5}} = 1\frac{1}{2}, \text{ Ans.}$$

416. $\$20 \div 6\frac{1}{4} = \frac{\overset{4}{\cancel{20}}}{\underset{5}{\cancel{25}}} \times \frac{4}{\cancel{25}} = \frac{16}{5} = \$3\frac{1}{5}$, per acre;

$$\$3\frac{1}{5} \times 9\frac{3}{8} = \frac{\overset{2}{\cancel{16}}}{\cancel{5}} \times \frac{\overset{15}{\cancel{75}}}{\cancel{8}} = \$30, \text{ Ans.}$$

417.

$50 \div 10\frac{4}{5} = \frac{\overset{25}{\cancel{50}}}{\underset{27}{\cancel{54}}} \times \frac{5}{\cancel{54}} = \frac{125}{27} = 4\frac{17}{27}$; $12\frac{3}{4} - 4\frac{17}{27} = 8\frac{13}{108}$, Ans.

418. $\$236 \div 11\frac{4}{5} = \overset{4}{\cancel{236}} \times \frac{5}{\cancel{59}} = \$20$, cost of one acre;

$$20\tfrac{7}{10} \times 20 = \frac{207}{\cancel{10}} \times \overset{2}{\cancel{20}} = \$414, \text{ Ans.}$$

419.

$$\$969 \div 2\tfrac{3}{8} = \overset{51}{\cancel{969}} \times \frac{8}{\cancel{19}} = \$408; \quad \$969 - \$408 = \$561, \text{ Ans.}$$

Article 136.

34. $\begin{matrix}3)2157\\3)3741\end{matrix} = \frac{719}{1247}$, Ans.

35. $1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$
$2880 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 576$, Ans.

36. $243 = 3 \times 3 \times 3 \times 3 \times 3$
$972 = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3$
$576 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 = 15552$, Ans.

37. $\frac{5+6}{6+7} = \frac{11}{13}$; $\frac{11}{13} - \frac{5}{6} = \frac{66}{78} - \frac{65}{78} = \frac{1}{78}$; $\frac{11}{13}$ is $\frac{1}{78}$ greater than $\frac{5}{6}$; $\frac{6}{7} - \frac{11}{13} = \frac{78}{91} - \frac{77}{91} = \frac{1}{91}$; $\frac{11}{13}$ is $\frac{1}{91}$ less than $\frac{6}{7}$, Ans.

38. $\frac{38}{60} = \frac{190}{300}$, $\frac{3}{4} = \frac{225}{300}$, $\frac{17}{100} = \frac{51}{300}$;

$$\frac{190}{300} + \frac{225}{300} + \frac{51}{300} = \frac{466}{300} = 1\tfrac{83}{150}, \text{ Ans.}$$

$\frac{3}{4}$
$1\frac{1}{8}$
$3\frac{2}{5}$
$13\frac{7}{10}$
17
$1\frac{38}{40}$
$18\frac{38}{40}$, Ans.

39.

$$\frac{3}{4}+\frac{1}{8}+\frac{2}{5}+\frac{7}{10}=$$

$$\frac{30}{40}+\frac{5}{40}+\frac{16}{40}+\frac{28}{40}=\frac{79}{40}=1\tfrac{39}{40}$$

40. $16-\frac{117}{237}=15\frac{120}{237}-\frac{39}{79}=15\frac{81}{79}$, Ans.

41. $24\frac{1}{8}+9\frac{7}{8}=33\frac{8}{8}=34$, Ans.

42. $2\frac{1}{8}\times\frac{7}{8}$ of $\frac{9}{10}=\frac{17}{\cancel{16}}\times\frac{7}{8}\times\frac{\overset{3}{\cancel{9}}}{10}=\frac{357}{160}=2_{160}^{37}$, Ans.
$\cancel{16}$
2

43. $\frac{\cancel{3}}{7}$ of $\frac{5}{\cancel{9}}=\frac{5}{21}$, $\frac{1}{\cancel{2}}$ of $\frac{\overset{3}{\cancel{6}}}{\cancel{9}}=\frac{1}{3}$;
$\cancel{9}$
3

$$\frac{1}{3}-\frac{5}{21}=\frac{7}{21}-\frac{5}{21}=\frac{2}{21}, \text{ Ans.}$$

44. $229\frac{1}{2}\div 8\frac{1}{2}=\frac{\overset{27}{\cancel{459}}}{\cancel{2}}\times\frac{\cancel{2}}{\cancel{17}}=27$, Ans.
$\cancel{17}$

45. $\frac{31}{97}\div 3\frac{10}{97}=\frac{31}{\cancel{97}}\times\frac{\cancel{97}}{301}=\frac{31}{301}$, Ans.

46. $6=2\times 3$
$8=2\times 2\times 2$
$9=3\times 3$
$2\times 2\times 2\times 3\times 3=72$, Least common multiple.
$72+4=76$, Ans.

47. $\frac{5}{6} + \frac{13}{18} + \frac{5}{8} = \frac{60}{72} + \frac{52}{72} + \frac{45}{72} = \frac{157}{72} = 2\frac{13}{72}$, Ans.

48. $\frac{4}{7} \times \frac{13}{13} = \frac{52}{91}$, Ans.

49. $53 - 27 = 26$; $26 \times \frac{1}{5} = \frac{26}{5} = 5\frac{1}{5}$; $\frac{1}{2}$ of $\frac{1}{5} = \frac{1}{10}$;

$\frac{1}{10} + \frac{1}{5} = \frac{3}{10}$, what each boy has; $27 \times \frac{3}{10} = \frac{81}{10} = 8\frac{1}{10}$;

$8\frac{1}{10} + 5\frac{1}{5} = 13\frac{3}{10}$, Ans.

50. $\frac{1}{12} + \frac{1}{4} + \frac{1}{8} = \frac{2}{24} + \frac{6}{24} + \frac{3}{24} = \frac{11}{24}$

$\frac{1}{3} + \frac{1}{6} + \frac{1}{9} = \frac{6}{18} + \frac{3}{18} + \frac{2}{18} = \frac{11}{18}$

$$\frac{11}{24} \div \frac{11}{18} = \frac{\cancel{11}}{\cancel{24}_{4}} \times \frac{\overset{3}{\cancel{18}}}{\cancel{11}} = \frac{3}{4}, \text{ Ans.}$$

51. $\frac{2}{\cancel{3}}$ of $\frac{\overset{4}{\cancel{12}}}{7} = \frac{8}{7}$, $3\frac{1}{2} = \frac{7}{2} \times \frac{1}{16} = \frac{7}{32}$; $\frac{\overset{1}{\cancel{8}}}{\cancel{7}} \times \frac{\cancel{7}}{\cancel{32}_{4}} = \frac{1}{4}$, Ans.

52. $\frac{7}{12}$ of $2\frac{3}{4} = \frac{7}{12} \times \frac{11}{4} = \frac{77}{48}$; $\frac{77}{3} = \frac{77}{48} \times \frac{1}{3} = \frac{77}{144}$, Ans.

53. $\frac{7}{8} - \frac{6}{7} = \frac{49}{56} - \frac{48}{56} = \frac{1}{56}$; $\frac{1}{56}$ of the number $= 10$;

$\frac{56}{56}$ of the number $= 56 \times 10 = 560$, Ans.

54. $\frac{\cancel{5}}{\cancel{7}}$ of $\frac{\cancel{3}}{\cancel{15}_{\cancel{3}}}$ of $\frac{\cancel{4}}{\cancel{16}_{4}}$ of $\frac{\overset{5}{\cancel{35}}}{4} \times \frac{11}{\cancel{5}} = \frac{11}{16}$, Ans.

55. $\frac{3}{4}$ the cost $= \$105\frac{3}{4}$; $\frac{1}{4}$ the cost $= \frac{1}{3}$ of $\$105\frac{3}{4} = \$35\frac{1}{4}$; $\frac{4}{4}$ the cost $= 4 \times \$35\frac{1}{4} = \$141$, Ans.

56. $13\frac{7}{10} \times 7\frac{7}{8} = \frac{137}{10} \times \frac{63}{8} = \frac{8631}{80} = \$107\frac{71}{80}$, Ans.

57. $\$3\frac{33}{64} \div 1\frac{7}{8} = \frac{225}{64} \times \frac{8}{15} = \frac{15}{8} = \$1\frac{7}{8}$, Ans.

58. $\$350\frac{9}{16} \div \$17\frac{3}{4} = \frac{5609}{16} \times \frac{4}{71} = \frac{79}{4} = 19\frac{3}{4}$, Ans.

59.

$\frac{3}{8}$ cost $\$2.13$; $\frac{1}{8}$ cost $\frac{1}{3}$ of $\$2.13 = \$0.71$; $\frac{8}{8}$ cost $8 \times \$0.71 = \$5.68$;

$10\frac{1}{2} \times \$5.68 = \$59.64$, Ans.

60. $\frac{5}{5} - \frac{2}{5} = \frac{3}{5}$; $\frac{4}{7}$ of $\frac{3}{5}$, or $\frac{12}{35}$, $= 24$; $\frac{1}{35} = 2$; $\frac{35}{35} = 70$, Ans.

61. $\frac{3}{4}$ of 28 men $= 21$ men; $\frac{28 \times 42}{21} = 56$ days, Ans.

62. $6\frac{3}{4} \times 1\frac{1}{4} \div \frac{3}{4} = \frac{27}{4} \times \frac{5}{4} \times \frac{4}{3} = \frac{45}{4} = 11\frac{1}{4}$ yards, Ans.

63. $\frac{5}{7}$ of $1\frac{6}{13} = \frac{5}{7} \times \frac{19}{13} = \frac{95}{91}$, $\frac{24}{3\frac{1}{4}} = \frac{19}{7} \times \frac{4}{13} = \frac{76}{91}$;

$\frac{95}{91} \div \frac{76}{91} = \frac{95}{91} \times \frac{91}{76} = \frac{95}{76} = 1\frac{1}{4}$, Ans.

64. $\frac{5}{16} + \frac{7}{12} = \frac{15}{48} + \frac{28}{48} = \frac{43}{48}$; $\frac{48}{48} - \frac{43}{48} = \frac{5}{48}$, C.'s share.

$$\left.\begin{aligned} \tfrac{5}{\cancel{16}}\,{}^{60} \text{ of } \$\cancel{960} &= \$\,300, \text{ A.'s gain,} \\ \tfrac{7}{\cancel{12}}\,{}^{80} \text{ of } \$\cancel{960} &= \$\,560, \text{ B.'s gain,} \\ \tfrac{5}{\cancel{48}}\,{}^{20} \text{ of } \$\cancel{960} &= \$\,100, \text{ C.'s gain,} \end{aligned}\right\} \text{Ans.}$$

65.

$\frac{7}{8}$ cost $\$\frac{9}{8}$; $\frac{1}{8}$ cost $\frac{1}{7}$ of $\frac{9}{8} = \$\frac{9}{56}$; $\frac{8}{8}$ cost $\$ \times \frac{9}{\cancel{56}_{7}} = \frac{9}{7} = \$\,1\frac{2}{7}$;

$$\$\frac{9}{11} \div \$\,1\tfrac{2}{7} = \frac{\cancel{9}}{11} \times \frac{7}{\cancel{9}} = \frac{7}{11} \text{ gallon, Ans.}$$

66. $\frac{2}{3} = \$\,3300$; $\frac{1}{3} = \frac{1}{2}$ of $\$\,3300 = \$\,1650$;

$\frac{3}{3} = 3 \times \$\,1650 = \$\,4950$;

$$\frac{3}{\cancel{10}}\,{}^{495} \text{ of } \$\cancel{4950} = \$\,1485, \text{ Ans.}$$

67. $\$\,5\frac{7}{16} \div 7\frac{1}{4} = \frac{\cancel{87}^{3}}{\cancel{16}_{4}} \times \frac{\cancel{4}}{\cancel{29}} = \$\frac{3}{4}$, cost of 1 pound;

$$\$\,23\tfrac{5}{8} \div \$\frac{3}{4} = \frac{\cancel{189}^{63}}{\cancel{8}_{2}} \times \frac{\cancel{4}}{\cancel{3}} = \frac{63}{2} = 31\tfrac{1}{2} \text{ pounds, Ans.}$$

68. $\$\,3\frac{11}{16} \div 4 = \frac{59}{16} \times \frac{1}{4} = \$\frac{59}{64}$, cost of one bushel.

$$\$\frac{59}{64} \times 7 = \frac{413}{64} = \$\,6\tfrac{29}{64}, \text{ Ans.}$$

69. $\$\frac{3}{4} + \$\,1\frac{1}{2} = \$\,2\frac{1}{4}$, what B receives;

$\frac{2}{3}$ of $2\frac{1}{4} = \frac{\cancel{2}}{\cancel{3}}$ of $\frac{\overset{3}{\cancel{9}}}{\underset{2}{\cancel{4}}} = \$\,1\frac{1}{2}$, what A receives.

$$\$\,1\tfrac{1}{2} - \$\tfrac{3}{4} = \frac{6}{4} - \frac{3}{4} = \$\frac{3}{4}, \text{ Ans.}$$

70. A spends $\frac{4}{4} - \frac{1}{4} = \frac{3}{4}$ of his income;

B spends $1\frac{1}{2} \times \frac{3}{4} = \frac{3}{2} \times \frac{3}{4} = \frac{9}{8}$ of his income;

$\frac{9}{8} - \frac{8}{8} = \frac{1}{8}$, B spends more than income; $\frac{1}{8} = \$\,62\frac{1}{2}$;

$$\frac{8}{8} = 8 \times \$\,62\tfrac{1}{2} = \$\,500, \text{ Ans.}$$

71. One pipe empties $\frac{1}{5}$ of the contents in 1 minute; the other pipe empties $\frac{1}{7}$ of the contents in 1 minute; together they empty $\frac{1}{5} + \frac{1}{7}$ of the contents per minute.

$$\frac{1}{5} + \frac{1}{7} = \frac{5}{35} + \frac{7}{35} = \frac{12}{35}$$

7 out of every 12 parts, or $\frac{7}{12}$, runs through the larger pipe. $\frac{7}{12}$ of 960 gal. = 560 gal. The remainder, or 400 gal., runs through the other pipe.

72. $\frac{1}{6 + 7\frac{1}{2}} = 1 \times \frac{2}{27} = \frac{2}{27}$; $\frac{3}{5}$ of $1\frac{2}{3} = \frac{\overset{1}{\cancel{3}}}{\cancel{5}} \times \frac{\cancel{5}}{\underset{1}{\cancel{3}}} = 1$;

$$1\tfrac{2}{7} \div 1\tfrac{1}{4} = \frac{9}{7} \times \frac{4}{5} = \frac{36}{35};$$

$$\frac{2}{27} + 1 + \frac{36}{35} + \frac{9}{35} = \frac{70}{945} + \frac{945}{945} + \frac{972}{945} + \frac{243}{945} = \frac{2230}{945} = 2\tfrac{\cancel{6}\,\cancel{8}}{\cancel{1}\,\cancel{8}\,\cancel{9}}, \text{ Ans}$$

Article 142.

54. 71.5.

55. 19.000; 43.600; 0.640; 53.000.

56. 15.60; 4.70; 13.00.

57. 18.0156; 401.6000; 176.4700.

63. $\frac{9}{40}$. **64.** $\frac{7}{8}$.

Article 143.

65. $\frac{1}{40}$. **70.** $\frac{3}{8}$. **75.** $9\frac{3}{8}$. **79.** $\frac{1}{64}$.

66. $\frac{561}{1000}$. **71.** $\frac{46}{125}$. **76.** $115\frac{7}{8}$. **84.** .6.

67. $\frac{27}{500}$. **72.** $11\frac{3}{4}$. **77.** $\frac{11}{800}$. **86.** $.416\frac{2}{3}$.

68. $\frac{2}{5}$. **73.** $4\frac{7}{16}$. **78.** $200\frac{24}{25}$. **87.** $.3636\frac{4}{11}$.

69. $\frac{5}{8}$. **74.** $\frac{3}{32}$.

Article 144.

88. .275. **93.** 4.096. **98.** .5833.

89. .4375. **94.** 4.015625. **99.** .9474.

90. .03125. **95.** 2.09375. **100.** $.0933\frac{1}{3}$.

91. .7. **96.** 5.0078125. **101.** .135135.

92. .32. **97.** $.0769\frac{3}{13}$.

102

$\frac{2}{3} = .667$
$\frac{21}{38} = .553$
$\frac{3}{260} = .012$
$\overline{1.232}$, Ans.

103.

$15\frac{5}{6} = 15.8333$
$20\frac{2}{8} = 20.6250$
$12\frac{4}{5} = 12.8000$
$2.68 = 2.6800$
$\overline{51.9383}$, Ans.

104.

15.057000
$3\frac{41}{333} = 3.123123$
$\overline{11.933877}$, Ans.

Article 145.

111.

671
.305
3355
2013
$\overline{204.655}$, Ans.

112.

18.72
7.1
1872
13104
$\overline{132.912}$, Ans.

Article 146.

115. 5.64
45
2820
2256
253.80, Ans.

116. 96.5
100
9650.0, Ans.

117. 6.34
.0023
1902
1268
.014582, Ans.

118. 42.2
2.004
1688
844
84.5688, Ans.

119. 1671
.013
5013
1671
21.723, Ans.

120. .563
47
3941
2252
26.461, Ans.

121. 19634
.0073
58902
137438
143.3282, Ans.

122. .0703
.0055
3515
3515
.00038665, Ans.

123. .0505
.001
.0000505, Ans.

124. .0076
.017
532
76
.0001292, Ans.

125. 1000000
.000001
1.000000, Ans.

126. $4.50
35.75
2250
3150
2250
1350
$160.8750, Ans.

127. $4.62
13.375
2310
3234
1386
1386
462
$61.79250, Ans.

128. .101
.10101
101
101
101
.01020201, Ans.

138. 4) 1.264
.316, Ans.

139. 105.) 100.115
.023, Ans.

Article 147.

142. 125.36, Ans.

6|25.) 783|50.00
625
1585
1250
3350
3125
2250
1875
3750
3750

143. .756, Ans.

|025.) |018.900
17 5
1 40
1 25
150
150

144. |001.) |010.01
10.01, Ans.

145. 790, Ans.

|00135.) 1|06650.
945
1215
1215
0

146. .081, Ans.

1|08.) |08.748
8 64
108
108

147. .893+, Ans.

|9147.) |8170.000
7317 6
852 40
823 23
29 170
27 441
1 729

148. .001365, Ans.

1000) 1.365000
1 000
3650
3000
6500
6000
5000
5000

149. 4000, Ans.

|018.) 72|000.
72
000

150. 150000, Ans.

|0037.) 555|0000.
37
185
185
0000

151. 1.12, Ans.

|00143.) |00160.16
143
171
143
286
286

152. 360.985—, Ans.

|264.) 95|300.000
792
1610
1584
2600
2376
2240
2112
1280
1056
224

153. 15.004+, Ans.

7|2.) 108|0.290
72
360
360
290
288
2

154. 210, Ans.

3|75.) 787|50.
750
375
375
0

MISCELLANEOUS EXERCISES.

155. .0403
400.0003

156. 0.00567
2.13007
1.00157

157. .0087
.00162
.000009

158. $4\frac{3}{8} + \frac{19}{20} = 4\frac{15}{40} + \frac{38}{40} = 4\frac{53}{40} = 5\frac{13}{40} = 5.325$, Ans.

159. 45.00000
36.00073
8.99927, Ans.

160. 25.7
8.389 58.000
23.056 57.145
57.145 .855, Ans.

161. 6346.0000
.6346
6345.3654, Ans.

4.2000
.0042
4.1958, Ans.

.0000500
.0000005
.0000495, Ans.

162. $3\frac{5}{8} = 3.625$
$17\frac{1}{4} = 17.250$
$476 = 476.000$
$3.125 = 3.125$
500.000, Ans.

163.

$$.03125 = \frac{3125}{100000} = \frac{1}{32}, \text{ Ans.}$$

164. $4 = 4.0000$
$2\frac{3}{4} = 2.7500$
$17 = 17.0000$
$.136 = .1360$
$.0408 = .0408$
23.9268, Ans.

165. 365.250000
365.242264
.007736
1880
618880
61888
7736
Ans. 14.543680 days.

166 7423.973
.413
7423.560

612, Ans.
12|130.) 742|3560.
72780
14556
12130
24260
24260

167. $ 7498.70
749.83
$ 6748.87

$\frac{1}{3}$ of $ 6748.87 = $ 2249.62$\frac{1}{3}$, C's;

$\frac{1}{3}$ of $ 6748.87 = $ 2249.62$\frac{1}{3}$, B's;

$ 2249.62$\frac{1}{3}$ + 749.83 =
$ 2999.45$\frac{1}{3}$, A's, Ans.

168. $20.104 \times 5.07 = 101.92728$

$6.44 \div .005 = 1288$

20004.
101.92728
20105.92728
1288.
18817.92728, Ans.

169. $2\frac{2}{3} = 2.667$

$4\frac{1}{3}\frac{1}{3} = 4.553$

$51.652 = 51.652$

58.872, Ans.

170.

$968.4900

$968.49 \times 3.4 = \$3292.8660$

$3292.866 \times 3.7 = \$12183.6042$

$16444.9602, Ans.

171.

4.9835, Ans.

30125.) 150775.0000
12100
29750
27225
25250
24200
10500
9075
14250
12100
2150

172.

$1 \div .01 = 100$

$.4 \times .0005 = .0002$

$.002 \times .0125 = .000025$

$.0002 + .000025 = .000225$

$.0009 \div .000225 = 4$

$100 - 4 = 96$, Ans.

173.

6116.
.027
42812
12232
165.132
.003
165.135, Ans.

174.

63 bushels.

94.) 5922.
564
282
282

$1.12, 1 bush. sold for.

63) 70.56
63
75
63
126
126

$1.12 — $0.94 = $0.18 gain, Ans.

175.

9.) $6 6.6
$7.4
60.5
37 0
444
$447.70, Ans.

176.

.064⅔
.3
.0194
$1728
1552
388
1358
194
$33.5232 = $33 33/125, Ans.

177.

12.8 ÷ .16 = 80
.128 ÷ .0016 = 80
80/80 = 1, Ans.

178.

.012/.840 = 1/70, Ans.

179.

$3.75 ÷ .6875 = $5 5/11, cost of 1 gal.
40.25
$5 5/11
20125
1829 6/11
$219.54 6/11, Ans.

180.

$15 7/8
8
$127, cost of 1 acre.
46.78
1016
889
762
508
$5941.06, Ans.

181. $\$14.40 \div \$0.18\frac{4}{5} = 1440 \times \frac{6}{113} = \frac{8640}{113} = 76\frac{52}{113}$ lb., Ans.

182.

$68\frac{437}{896}$ tons, Ans.

35|84.) 2458|60.
21504
30820
28672
2148
3584

$= \frac{537}{896}$

183.

|08.) 48|00.
6 00, number.
.7
420.0, Ans.

184.

.024
.06
|00144.) 5|76000.
576
000

4000, Ans.

185.

$\left(\frac{5}{6} \div .33\frac{1}{3}\right) = \frac{5}{6} \times \frac{3}{1} = \frac{5}{2} = 2\frac{1}{2}$

$\left(.87\frac{1}{2} \div \frac{1}{8}\right) = \frac{7}{8} \times \frac{8}{1} = 7$

$7 \times 2\frac{1}{2} = 17\frac{1}{2}$; $7 - 2\frac{1}{2} = 4\frac{1}{2}$

$17\frac{1}{2} \div 4\frac{1}{2} = \frac{35}{2} \times \frac{2}{9} = \frac{35}{9} = 3\frac{8}{9}$, Ans.

Article 154.

23.

$\$13.50$
2.63
5.00
6.13
$\$27.26$, Ans.

24.

$\$0.63$
0.80
7.50
32.00
$\$40.93$, Ans.

25.

$\$6500.00$
1356.85
$\$5143.15$, Ans.

26.

$\$0.14$
56
84
70
$\$7.84$

128
$\$0.09$
$\$11.52$
7.84
$\$19.36$, Ans.

27.

2 50 yd., Ans.
$\$0|19.) \$47|50.$
38
95
95

29. $7975
4560
$3415, cost of land.

$94.86+, Ans.
36) $3415.00
324
175
144
310
288
220
216
4

28.
491
$0.81
491
3928
$397.71

491
29
462
$0.95
2310
4158
$438.90
397.71
$41.19, Ans.

30.

$37.50
187
26250
30000
3753
$7012.50
8253
$15265.50

$63
131
63
189
63
$8253

187
131
318 acres.

$48.00+, Ans.
318) $15265.50
1272
2545
2544
150

31. $0.67.) $29.70. 44$\frac{22}{67}$, Ans.
268
290
268
22

32. $0.09.) $68.40. 760, Ans.

33.
7) $26.25
$3.75, cost of 1 bbl.
43.50
18750
1125
1500
$163.1250, or $163.12½, Ans.

34.

$20.40
35.45
10200
8160
10200
6120
$723.1800

15.50$\frac{10}{41}$ acres.
20⌊50.) 317⌊80.00
205 0
112 80
102 50
10 300
10 250
500
2050 = $\frac{10}{41}$

$1040.98
723.18
$317.80

35.45
15.50$\frac{10}{41}$
50.95$\frac{10}{41}$, Ans.

Article 156.

44. 1.37\frac{1}{2}$ = $1 + $$\frac{3}{8}$

$144 = cost at $1
54 = " $\frac{3}{8}$
Ans. $198 = " 1\frac{3}{8}$

45. 0.66\frac{2}{3}$ = $$\frac{2}{3}$

$\overset{28}{\cancel{84}} \times \frac{2}{\cancel{3}} = $56, Ans.

46. 3.87\frac{1}{2}$ = $3 + $$\frac{7}{8}$

$60 = cost at $1.
$180.00 = cost at $3
52.50 = " $\frac{7}{8}$
Ans. $232.50 = " 3.87\frac{1}{2}$

47. 5.12\frac{1}{2}$ = $5.125

98 doz., Ans.
$5⌊125.) $502⌊250.
461 25
41 000
41 000

48. 18, Ans.
$1⌊625.) $29⌊250.
16 25
13 000
13 000

49. 0.87\frac{1}{2}$ = $$\frac{7}{8}$

$\overset{7}{\cancel{56}} \times \frac{7}{\cancel{8}} = $49, Ans.

50.

$\$2.25 = \$2 + \$\frac{1}{4}$

$\$302 =$ earn at $\$1$

$\$604.00 =$ earn at $\$2$

$75.50 =$ " $.25$

Ans. $\$679.50 =$ " $\$2.25$

51. $\$0.37\frac{1}{2} = \$0.375$

2 117, Ans.

$\$0\frac{375}{1000}.)\$793\frac{875}{1000}.$

750

438

375

637

375

2625

2625

53. $1360 = 13.60$ hund.; $\$0.37\frac{1}{2} = \$\frac{3}{8}$; $13.60 \times \frac{3}{8} =$ 1.70

$\$5.10$, Ans.

54. $650 = 6.50$, or $6\frac{1}{2}$ hundreds; $6\frac{1}{2} \times \$12.50 = \$81.25$, Ans.

56. $5650 = 5.65$ M.; $5.65 \times \$44 = \$248.60$, Ans.

57. $4565 = 4.565$ M.; $4.565 \times \$23 = \$104.995$

$13640 = 13.64$ M.; $13.64 \times \$53.55 = \$730.422$

$15250 = 15\frac{1}{4}$ thousands; $15\frac{1}{4} \times \$4.50 = \$68.625$

$\$104.995$

730.422

68.625

$\$904.042$, Ans.

59. $8375 = 8.375$ M.; $\$100.50 \div 8.375 = \$12$, Ans.

60. $650 = 6.50$, or $6\frac{1}{2}$ hundreds; $\$81.25 \div 6\frac{1}{2} = \$12.50$, Ans.

61. $\$30$, sold 1 acre for. $\$31.50$

75.8) $\$2274.0$ 30

2274 Ans. $\$1.50$, loss per acre.

0

Article 159.

62.

HENRY OTIS,

In Account with JAMES DELANY, Dr.

1896.

Jan. 3	To 1 bbl. Molasses, 44 gal.	@	55¢	$ 24	20
" "	" 100 lb. Carolina Rice	"	7¢	7	00
Feb. 8	" 50 lb. Mocha Coffee	"	28¢	14	00
Mar. 17	" 1 bbl. Sugar, 328 lb.	"	9¢	29	52
Apr. 22	" 1 box Tea, 35 lb.	"	45¢	15	75
				$ 90	47

63.

New York, May 16, 1896.

MR. JAMES COOPER,

Bought of ARTHUR GILMAN & Co.

5 bbl. Clear Pork	@	$ 20.50	$ 102	50
3 bbl. New Mess Beef	"	12.50	37	50
2 bbl. Lard, 421 lb.	"	0.11	46	31
364 lb. Smoked Ham	"	0.10	36	40
			$ 222	71

Received Payment,

ARTHUR GILMAN & Co.

64.

Providence, June 11, 1897.

MR. WILLIAM BAKER,

To JOHN O'BRIEN, DR.

To 6 days' Labor	@	$ 2.50	$ 15	00
" 6 days' Labor of Boy	"	1.25	7	50
" 2 bbl. Rockland Lime	"	0.95	1	90
" 3450 Bricks, per M.	"	12.00	41	40
" Carting	"	2.75	2	75
			$ 68	55
Cr.				
By 1 Month's Rent		$ 10.00	10	00
			$ 58	55

Received Payment,

JOHN O'BRIEN,

By PETER O'BRIEN.

65.

Burlington, July 19, 1897.

MR. GEORGE ALLEN,

1897. Bought of ALBERT LANE & SONS.

May	9	61 yd. American Prints	@ 7¢	$4 27
"	11	84 yd. Avon Sheeting	" 8¢	6 72
"	13	94 yd. Samoset Ticking	" 19¢	17 86
June	7	10 doz. Merino Hose	" $2.24	22 40
"	11	83 yd. Prints	" .6¢	4 98
				$56.23

Paid, July 21, 1897.

ALBERT LANE & SONS.

66.

New Orleans, July 1, 1896.

HARLAN, JONES, & Co.,

1896. In Account with FELIX REMOND, Dr.

June	3	15 bbl. N. P. Flour	@ $8.25	$123 75
"	5	10 bbl. St. Louis Flour	" 7.40	74 00
"	9	3 tubs Butter, 121 lb.	" .30	36 30
"	15	125 lb. Smoked Ham	" .10	12 50
"	25	43 lb. Cheese	" .11	4 73
				251 28
		Cr.		
"	9	Merchandise	$96.50	
"	15	Cash	50.00	146 50
		Balance due F. R.		$104.78

Received Payment, July 3, 1896.

FELIX REMOND.

67.

Trenton, Oct. 3, 1896.

ANDREW SHAW,

Bought of INGRAM, SMITH, & Co.

25 pairs	Kip Boots	@ $2.50	$62 50
20 "	Calf Boots	" 2.75	55 00
30 "	New Brunswick Rub. Boots	" 3.00	90 00
15 "	Kip Brogan Shoes	" 1.25	18 75
	Carting		25
			$226.50

68.

St. Paul, Sept. 15, 1897.

JACOB VAN HUSEN,

Bought of HOOPER, BLAKE, & DUDLEY.

100 bbl. Best Test Patent Flour @ $ 8.25...	$ 825	00
50 bbl. Wilbur's Extra Flour..... " 6.50...	325	00
Freight	6	25
	$ 1156.25	

Received Payment,

HOOPER, BLAKE, & DUDLEY.

69.

June 1, 1896.

JOSEPH MCINTIRE,

To ..... Dr.

To Services, 3 months .....@ $ 28.....$ 84.00

Received Payment,

70.

Chicago, Nov. 1, 1897.

WILLIAM ASBURY,

In Account with GEORGE W. OGDEN & BRO.

1897.

Oct. 2	To 50 tons Franklin Coal .....@ $ 5.25...	$ 262	50
" 10	" 75 " Cumberland Coal ... " 4.75...	356	25
" 16	" 25 cords Pine Wood ..... " 4.75...	118	75
		737	50
	Cr.		
" 10	By Cash ..... $ 262.50		
" 20	" Merchandise 31.65	294	15
		$ 443.35	

Received Payment,

GEORGE W. OGDEN & BROTHER.

71.

Nov. 10, 1898.

ARTHUR ROBERTS,

Bought of JORDAN, MARSH, & Co.

64½ yd.	Tapestry Carpet ..... @	87½ ¢ ...	$ 56	44
27 "	Brussels Carpet ..... "	$ 1.85 ...	49	95
18¾ "	Oilcloth ..... "	37½ ¢ ...	7	03
	Making and laying		13	22
			$ 126.64	

Article 187.

13. 19 bu. 3 pk. 7 qt. 1 pt.

4

79 pk.

8

639 qt.

2

Ans. 1279 pt.

14. 48 cu. yd. 15 cu. ft.

27

351

96

Ans. 1311 cu. ft.

15. 17 T. 17 cwt. 90 lb.

20

357 cwt.

100

Ans. 35790 lb.

Article 188.

16. 12 A. 144 sq. rd. 144 sq. ft.

160

864

12

2064 sq. rd.

272¼

4272

14448

4128

516

Ans. 562068 sq. ft.

17. 5 cu. yd. 23 cu. ft. 725 cu. in.

27

38

12

158 cu. ft.

1728

1264

316

1106

158725

Ans. 273749 cu. in.

18. 60 gal. 3 qt. 1 pt.
4
243 qt.
2
Ans. 487 pt.

19. 13 bu. 2 pk. 7 qt. 1 pt.
4
54 pk.
8
439 qt.
2
Ans. 879 pt.

20. 47 mi.
320
940
141
15040 rd.
16½
90240
15040
7520
Ans. 248160 ft.

21. 72 lb. 10 oz. 15 pwt. 7 gr.
12
874 oz.
20
17495 pwt.
24
69987
34990
Ans. 419887 gr.

22.

43 T. 13 cwt. 20 lb.
20
873 cwt.
100
Ans. 87320 lb.

23. 365 d. 5 h. 48 m. 50 sec.
24
1465
730
8765 h.
60
525948 m.
60
Ans. 31556930 sec.

24. 8 cu. yd. 10 cu. ft. 728 cu. in.
27
56
17
226 cu. ft.
1728
2536
452
1582
226
Ans. 391256 cu. in.

25.

45° 28′ 54″
60
2728′
60
Ans. 163734″

26. 25 cd.
128
200
50
25
Ans. 3200 cu. ft.

27. 40 gal. 3 qt. 0 pt. 2 gi.
4
163 qt.
2
326 pt.
4
Ans. 1306 gi.

28. 67 wk. 6 d. 9 h. 52 min.
7
475 d.
24
1900
9509
11409 h.
60
Ans. 684592 min.

29. 4 bundles 1 ream
2
9 reams
20
180 quires
24
720
360
Ans. 4320 sheets.

30. 1 A. 80 sq. rd.
160
240 sq. rd.
272¼
480
1680
48060
65340 sq. ft.
$0.05 × 65340 = $3267, Ans.

31. 3 mi. 195 rd.
320
960
195
1155 rd.
$5.50 × 1155 = $6352.50, Ans.

33.

1 mi. = 1760 yd.; $\frac{1}{20}$ mi. = $\frac{1}{20}$ of $\overset{88}{\cancel{1760}}$ yd. = 88 yd., Ans.

34.

1 lb. = 5760 gr.; $\frac{1}{3840}$ lb. = $\frac{1}{\cancel{3840}_{3}}$ of $\overset{2}{\cancel{5760}}$ gr. = $\frac{2}{3}$ gr., Ans.

35.

1 d. = 86400 sec.; $\frac{1}{3\,1\,5\,3\,6\,0\,0}$ d. = $\frac{1}{\cancel{86400}\,\overset{27}{\cancel{3}}}$ of $\overset{27}{\cancel{86400}}$ sec. = $\frac{27}{28}$ sec., Ans.

36. 1 gal. = 32 gi.; $\frac{7}{2\,8\,8}$ gal. = $\frac{7}{\cancel{288}\,\overset{9}{\cancel{32}}}$ of $\cancel{32}$ gi. = $\frac{7}{9}$ gi., Ans.

37. 1 bushel = 32 quarts,

$\frac{2}{1\,5}$ bu. = $\frac{2}{15}$ of 32 qt. = $\frac{64}{15}$ = $4\frac{4}{15}$ qt., Ans.

39. .024 ton

2000

Ans. 48.000 lb.

40. .0075 A.

160

4500

75

1.2000 sq. rd.

$272\frac{1}{4}$

24000

84000

24000

3000

Ans. 326.7000 sq. ft.

41. .3945 d.

24

15780

7890

9.4680 h.

60

Ans. 568.0800 min.

42. 1.364 A.

160

81840

1364

218.240 sq. rd.

$30\frac{1}{4}$

6547200

54560

Ans. 6601.760 sq. yd.

Article 189.

51. 2) 1279 pt.

8) 639 + 1 pt.

4) 79 + 7 qt.

19 + 3 pk.

Ans. 19 bu. 3 pk. 7 qt. 1 pt.

52. 27) 1311 cu. ft.

48 + 15 cu. ft.

Ans. 48 cu. yd. 15 cu. ft.

53. 100) 35790 lb.

20) 357 + 90 lb.

17 T. + 17 cwt.

Ans. 17 T. 17 cwt. 90 lb.

Article 190.

54. $272\frac{1}{4}$) 562068 sq. ft.
4) 4
1089) 2248272
160) 2064 sq. rd. $\frac{144}{160}$ or 144 sq. ft.
12 A. 144 sq. rd.

Ans. 12 A. 144 sq. rd. 144 sq. ft.

55. 1728) 273749 cu. in.
27) 158 cu. ft. 725 cu. in.
5 cu. yd. 23 cu. ft.

Ans. 5 cu. yd. 23 cu. ft. 725 cu. in.

56. 2) 487 pt.
4) 243 qt. 1 pt.
60 gal. 3 qt.

Ans. 60 gal. 3 qt. 1 pt.

57. 2) 879 pt.
8) 439 qt. 1 pt.
4) 54 pk. 7 qt.
13 bu. 2 pk.

Ans. 13 bu. 2 pk. 7 qt. 1 pt.

58. $16\frac{1}{2}$) 248160 ft.
2) 2
33) 496320
320) 15040 rd.
Ans. 47 mi.

59. 24) 419887 gr.
20) 17495 pwt. 7 gr.
12) 874 oz. 15 pwt.
72 lb. 10 oz.

Ans. 72 lb. 10 oz. 15 pwt. 7 gr.

60. 100) 87320 lb.
20) 873 cwt. 20 lb.
43 T. 13 cwt.

Ans. 43 T. 13 cwt. 20 lb.

61. 60) 31556930 sec.
60) 525948 min. 50 sec.
24) 8765 h. 48 min.
365 d. 5 h.

Ans. 365 d. 5 h. 48 min. 50 sec.

62. 1728) 391256 cu. in.
27) 226 cu. ft. 728 cu. in.
8 cu. yd. 10 cu. ft.

Ans. 8 cu. yd. 10 cu. ft. 728 cu. in.

63. 60) 163734″
60) 2728′ 54″
45° 28′

Ans. 45° 28′ 54″.

64. 128) 3200 cu. ft.
Ans. 25 cd.

65. 4) 1306 gi.
2) 326 pt. 2 gi.
4) 163 qt.
40 gal. 3 qt.

Ans. 40 gal. 3 qt. 0 pt. 2 gi.

66. 60) 684592 min.
24) 11409 h. 52 min.
7) 475 d. 9 h.
67 w. 6 d.

Ans. 67 w. 6 d. 9 h. 52 min.

67. 24) 4320 sheets.
20) 180 quires.
2) 9 reams.
4 bundles 1 ream.

Ans. 4 bundles 1 ream.

68. .05) 3267.00
$272\frac{1}{4}$) 653 40 sq. ft.
4) 4
1089) 261360
160) 240 sq. rd.
Ans. 1 A. 80 sq. rd.

69.

5.50) 6352.50
320) 11 55 rd.
Ans. 3 mi. 195 rd.

71. 1 mi. = 1760 yd. 1 yd. = $\frac{1}{1760}$ mi.

$$88 \text{ yd.} = \cancel{88} \times \frac{1}{\cancel{1760}\ 20} \text{ mi.} = \frac{1}{20} \text{ mi., Ans.}$$

72. 1 lb. = 5760 gr. 1 gr. = $\frac{1}{5760}$ lb.

$$3000 \text{ gr.} = \overset{25}{\cancel{3000}} \times \frac{1}{\cancel{5760}\ 48} \text{ lb.} = \frac{25}{48} \text{ lb., Ans.}$$

73. 1 day = 86400 sec. 1 sec. = $\frac{1}{86400}$ day.

12600 sec. = $\overset{7}{\cancel{12600}} \times \frac{1}{\underset{48}{\cancel{86400}}}$ day = $\frac{7}{48}$ day, **Ans.**

74. 1 gal. = 32 gi. 1 gi. = $\frac{1}{32}$ gal.

24 gi. = $\overset{3}{\cancel{24}} \times \frac{1}{\underset{4}{\cancel{32}}}$ gal. = $\frac{3}{4}$ gal., Ans.

75. 1 bu. = 32 qt. 1 qt. = $\frac{1}{32}$ bu.

$4\frac{4}{15}$ qt. = $4\frac{4}{15} \times \frac{1}{32}$ bu. = $\frac{\overset{2}{\cancel{64}}}{15} \times \frac{1}{\cancel{32}} = \frac{2}{15}$ bu., Ans.

77. 2000) 48.000 lb.
Ans. .024 T.

78. $272\frac{1}{4}$) 326.7 sq. ft.
4 4
1089) 1306.8
160) 1.2000 sq. rd.
Ans. .0075 A.

79. 60) 568.080 min.
24) 9.468 h.
Ans. .3945 d.

80. $30\frac{1}{4}$) 6601.76 sq. yd.
4 4
121) 26407.04
160) 218.240 sq. rd.
Ans. 1.364 A.

Article 191.

88. $\frac{2}{9}$ mi. = $\frac{2}{9}$ of 320 rd. = $71\frac{1}{9}$ rd.

$\frac{1}{9}$ rd. = $\frac{1}{9}$ of $16\frac{1}{2}$ ft. = $1\frac{5}{6}$ ft.

$\frac{5}{6}$ ft. = $\frac{5}{\cancel{6}}$ of $\overset{2}{\cancel{12}}$ in. = 10 in.

Ans. 71 rd. 1 ft. 10 in.

90. .53 rd. $= .53$ of $5\frac{1}{2}$ yd. $= 2.915$ yd.
.915 yd. $= .915$ of 3 ft. $= 2.745$ ft.
.745 ft. $= .745$ of 12 in. $= 8.94$ in.

Ans. 2 yd. 2 ft. 8.94 in.

Article 192.

91. $\frac{3}{7}$ A. $= \frac{3}{7}$ of 160 sq. rd. $= 68\frac{4}{7}$ sq. rd.

$\frac{4}{7}$ sq. rd. $= \frac{4}{7}$ of $272\frac{1}{4}$ sq. ft. $= 155\frac{5}{7}$ sq. ft.

$\frac{4}{7}$ sq. ft. $= \frac{4}{7}$ of 144 sq. in. $= 82\frac{2}{7}$ sq. in.

Ans. 68 sq. rd. 155 sq. ft. $82\frac{2}{7}$ sq. in.

92. $\frac{8}{9}$ lb. $= \frac{8}{9}$ of 12 oz. $= 10\frac{2}{3}$ oz.

$\frac{2}{3}$ oz. $= \frac{2}{3}$ of 20 pwt. $= 13\frac{1}{3}$ pwt.

$\frac{1}{3}$ pwt. $= \frac{1}{3}$ of 24 gr. $= 8$ gr.

Ans. 10 oz. 13 pwt. 8 gr.

93. $\frac{7}{11}$ y. $= \frac{7}{11}$ of 365 d. $= 232\frac{3}{11}$ d.

$\frac{3}{11}$ d. $= \frac{3}{11}$ of 24 h. $= 6\frac{6}{11}$ h.

$\frac{6}{11}$ h. $= \frac{6}{11}$ of 60 min. $= 32\frac{8}{11}$ min.

$\frac{8}{11}$ min. $= \frac{8}{11}$ of 60 sec. $= 43\frac{7}{11}$ sec.

Ans. 232 d. 6 h. 32 min. $43\frac{7}{11}$ sec.

94. $\frac{7}{9}$ mi. $= \frac{7}{9}$ of 320 rd. $= 248\frac{8}{9}$ rd.

$\frac{8}{9}$ rd. $= \frac{8}{9}$ of $5\frac{1}{2}$ yd. $= 4\frac{8}{9}$ yd.

$\frac{8}{9}$ yd. $= \frac{8}{9}$ of 3 ft. $= 2\frac{2}{3}$ ft.

$\frac{2}{3}$ ft. $= \frac{2}{3}$ of 12 in. $= 8$ in.

Ans. 248 rd. 4 yd. 2 ft. 8 in.

95. .6725 cental = .6725 of 100 lb. = 67.25 lb.
.25 lb. = .25 of 16 oz. = 4 oz.

Ans. 67 lb. 4 oz.

96. .282 T. = .282 of 20 cwt. = 5.64 cwt.
.64 cwt. = .64 of 100 lb. = 64 lb.

Ans. 5 cwt. 64 lb.

97. .875 rd. = .875 of $5\frac{1}{2}$ yd. = 4.8125 yd.
.8125 yd. = .8125 of 3 ft. = 2.4375 ft.
.4375 ft. = .4375 of 12 in. = 5.25 in.

Ans. 4 yd. 2 ft. 5.25 in.

98. .761 d. = .761 of 24 h. = 18.264 h.
.264 h. = .264 of 60 min. = 15.84 min.
.84 min. = .84 of 60 sec. = 50.4 sec.

Ans. 18 h. 15 min. 50.4 sec.

107. 10 in. $= 10 \div 12 = \frac{5}{6}$ ft.

$1\frac{5}{6}$ ft. $= \frac{11}{6} \div 16\frac{1}{2} = \frac{1}{9}$ rd.

$71\frac{1}{9}$ rd. $= \frac{640}{9} \div 320 = \frac{2}{9}$ mi., Ans.

109. 8.94 in. $= 8.94 \div 12 = .745$ ft.
2.745 ft. $= 2.745 \div 3 = .915$ yd.
2.915 yd. $= 2.915 \div 5\frac{1}{2} = .53$ rd., Ans.

Article 193.

110. 155 sq. ft. $= 155 \div 272\frac{1}{4} = \frac{620}{1089}$ sq. rd.

$68\frac{620}{1089}$ sq. rd. $= 68\frac{620}{1089} \div 160 = \frac{4667}{10890}$ A., Ans.

111. 8 gr. $= 8 \div 24 = \frac{1}{3}$ pwt.

$13\frac{1}{3}$ pwt. $= \frac{40}{3} \div 20 = \frac{2}{3}$ oz.

$10\frac{2}{3}$ oz. $= \frac{32}{3} \div 12 = \frac{8}{9}$ lb., Ans.

112. 21 min. $= 21 \div 60 = \frac{7}{20}$ h.

$10\frac{7}{20}$ h. $= 10\frac{7}{20} \div 24 = \frac{207}{480}$ d.

$232\frac{207}{480}$ d. $= \frac{111567}{480} \div 365 = \frac{37189}{58400}$ y., Ans.

113. 8 in. $= 8 \div 12 = \frac{2}{3}$ ft.

$2\frac{2}{3}$ ft. $= \frac{8}{3} \div 3 = \frac{8}{9}$ yd.

$4\frac{8}{9}$ yd. $= \frac{44}{9} \div 5\frac{1}{2} = \frac{8}{9}$ rd.

$248\frac{8}{9}$ rd. $= \frac{2240}{9} \div 320 = \frac{7}{9}$ mi., Ans.

114. 4 oz. $= 4 \div 16 = .25$ lb.
$67.25 = 67.25 \div 100 = .6725$ cental, Ans.

115. 64 lb. $= 64 \div 100 = .64$ cwt.
5.64 cwt. $= 5.64 \div 20 = .282$ T., Ans.

116. 5.25 in. $= 5.25 \div 12 = .4375$ ft.
2.4375 ft. $= 2.4375 \div 3 = .8125$ yd.
4.8125 yd. $= 4.8125 \div 5\frac{1}{2} = .875$ rd., Ans.

117. 50.4 sec. $= 50.4 \div 60 = .84$ min.
15.84 min. $= 15.84 \div 60 = .264$ h.
18.264 h. $= 18.264 \div 24 = .761$ d., Ans.

Article 194.

118. 2 A. 112 sq. rd. = 432 sq. rd. $\frac{144}{432} = \frac{1}{3}$, Ans.
144 sq. rd. = 144 sq. rd.

119. 3 mi. 120 rd. 4 yd. = 5944 yd. $\frac{4183}{5944}$, Ans.
2 mi. 120 rd. 3 yd. = 4183 yd.

120.

1 lb. 4 oz. 12 pwt. 12 gr. = 7980 gr.
5 oz. 10 pwt. = 2640 gr.

$\frac{2640}{7980} = \frac{44}{133}$, Ans.

121.

74 mi. 80 rd. = 23760 rd.
9 mi. 90 rd. = 2970 rd.

$\frac{2970}{23760} = \frac{1}{8} = .125$, Ans.

122. 7 bu. 1 pk. 5 qt. = 237 qt.
82 bu. 3 pk. 1 qt. = 2649 qt.

$$\frac{2649}{237} = \frac{883}{79} = 11.17\tfrac{74}{79}, \text{ Ans.}$$

Article 195.

126.

63 cu. yd. 11 cu. ft. 842 cu. in.

127. 199 gal. 1 qt.

128.

77 d. 8 h. 26 min. 56 sec.

129. $64° 28' 32''$.

131.

$\frac{7}{11}$ T. = 12 cwt. $72\frac{8}{11}$ lb.
$\frac{1}{2}\frac{7}{2}$ ctl. = $77\frac{3}{11}$
1 T. 2 3
Ans. 1 T. 15 cwt. 53 lb.

132.

$60\frac{3}{4}$ mi. = 60 mi. 240 rd.
50 120
$56\frac{5}{8}$ mi. = 56 200
Ans. 167 mi. 240 rd.

133.

$\frac{4}{7}$ A. = $114\frac{2}{7}$ sq. rd.
$\frac{3}{8}$ A. = $106\frac{3}{8}$
$1\frac{3}{4}$ A. = $148\frac{4}{7}$
Ans. 2 A. $49\frac{1}{1}\frac{1}{4}$ sq. rd.

135.

73 bu. 2 pk. 5 qt.
59 3 7
Ans. 13 bu. 2 pk. 6 qt.

136.

17 mi. 311 rd. 1 yd. 1 ft. 3 in.
3 79 1 2 7
Ans. 14 mi. 231 rd. $4\frac{1}{2}$ yd. 1 ft. 8 in.
Or,
14 mi. 231 rd. 5 yd. 0 ft. 2 in.

137.

116 A. 53 sq. rd. 100 sq. ft. 113 sq. in.
87 137 100 113
Ans. 28 A. 76 sq. rd. 0 sq. ft. 0 sq. in.

138.

$87° 35' 0''$
71 4 9
Ans. $16° 30' 51''$

139.

$\frac{1}{1}\frac{1}{8}$ lb. = 7 oz. 6 pwt. 16 gr.
2 0 19.2
Ans. 5 oz. 5 pwt. 20.8 gr.

140.

1 hhd. = 63 gal. 0 qt. 0 pt. 0 gi.
$\frac{4}{5}$ hhd. = 50 1 1 $0\frac{4}{5}$
Ans. 12 gal. 2 qt. 0 pt. $3\frac{1}{5}$ gi.

141. .367 y. = 133 d. 22 h. 55 min. 12 sec.
.761 d. = 18 15 50.4
Ans. 133 d. 4 h. 39 min. 21.6 sec.

142. .7895 mi. = 252 rd. 3 yd. 1 ft. 6.72 in.
$\frac{3}{5}$ mi. = 71 0 1 10
Ans. 181 rd. 2 yd. 2 ft. 8.72 in.

Article 196.

144. Oct. 16, 1876, to Oct. 16, 1881, = 5 y.
Oct. 16, 1881, to July 16, 1882, = 9 mo.
July 16, 1882, to Aug. 9, 1882, = 24 d.
Oct. 16, 1876, to Aug. 9, 1882, = 5 y. 9 mo. 24 d., Ans.

145. Nov. 15, 1879, to Nov. 15, 1880, = 1 y.
Nov. 15, 1880, to June 15, 1881, = 7 mo.
June 15, 1881, to July 5, 1881, = 20 d.
Nov. 15, 1879, to July 5, 1881, = 1 y. 7 mo. 20 d., Ans.

146. Oct. 19, 1781, to Oct. 19, 1814, = 33 y.
Oct. 19, 1814, to Dec. 19, 1814, = 2 mo.
Dec. 19, 1814, to Jan. 8, 1815, = 20 d.
Oct. 19, 1781, to Jan. 8, 1815, = 33 y. 2 mo. 20 d., Ans.

147. July 4, 1776, to July 4, 1862, = 86 y.
July 4, 1862, to Dec. 4, 1862, = 5 mo.
Dec. 4, 1862, to Jan. 1, 1863, = 28 d.
July 4, 1776, to Jan. 1, 1863, = 86 y. 5 mo. 28 d., Ans.

149. April = 21 days.
May = 31
June = 8
Ans. 60 days.

150. May = 5 d. 2 h.
June = 30
July = 31
Aug. = 31
Sept. = 30
Oct. = 31
Nov. = 30
Dec. = 31
Jan. = 31
Feb. = 28
Mar. = 4 9
Ans. 282 d. 11 h.

152. 141 wk. 4 d. 22 h. 16 min.

153. 37 mi. 170 rd. 1 yd.

154. 10 T. 8 cwt. 53 lb.

155. 355 A. 49 sq. rd. $21\frac{3}{4}$ sq. yd.

156. 263° 51′ 40″.

158. 17 wk. 3 d. 10 h. 17 min.

159. 3 mi. 124 rd. 1 yd. $1\frac{1}{3}$ ft.

160. 3 oz. 17 pwt. 14 gr.

161. 13° 10′ 35″.

162. 61 gal. 1 qt. 1 pt.

MISCELLANEOUS EXERCISES.

163. 18 rd. 5 yd. 2 ft. 11 in.
$5\frac{1}{2}$
104 yd.
3
314 ft.
12
628
314
11
Ans. 3779 in.

164. 5 T. 17 cwt. 25 lb.
20
117 cwt.
100
11725 lb.
$0.03
$351.75, Ans.

165. $0.03) $396.18
100) 132 06 lb.
20) 1 32 cwt. 6 lb.
6 T. 12 cwt.
Ans. 6 T. 12 cwt. 6 lb.

166. 1 common year = 365 d.
1 day = $\frac{1}{365}$ year.
$\frac{8}{27}$ d. = $\frac{8}{27} \times \frac{1}{365}$ y. = $\frac{8}{9855}$, Ans.

167. 50 T. 5 ctl. 75 lb.
47 17 35
Ans. 98 T. 3 ctl. 10 lb.

168. 1 mi. = 1760 yd.; 2 mi. = 2 × 1760 = 3520 yd.; 3520 ÷ 55 = 64. It gains 5 ft. in 55 yd.; in 3520 yd., or 64 times 55 yd., it will gain 64 times 5 ft., or 320 ft. =
19 rd. 6 ft. 6 in., Ans.

169. 2 A. 65 sq. rd.
$8\frac{1}{4}$
Ans. 19 A. $136\frac{1}{4}$ sq. rd., or 19 A. 136 sq. rd. 68 sq. ft. 9 sq. in.

170. June 11, 1879, to June 11, 1880, = 366 d.
June 11, 1881, to June 11, 1881, = 365
June 11, 1881, to Aug. 5, 1881, = 55
June 11, 1879, to Aug. 5, 1881, = 786 d. Ans.

171. 9) 21 T. 537 lb.
Ans. 2 T. $726\frac{1}{3}$ lb.

172. 47) 13267583
60) 282289 min.
24) 4704 h. 49 min.
196 d.
Ans. 196 d. 0 h. 49 min.

173. 7 A. 148 sq. rd.
160
1120
148
1268 sq. rd.
1 A. = 160 sq. rd.
20 A. = 20 × 160 sq. rd. = 3200 sq. rd.
$\frac{1268}{3200} = \frac{317}{800} = .39625$, Ans.

174. 12) 24 cd. 102 cu. ft.
2 cd. $8\frac{1}{2}$ cu. ft.
128
256
$8\frac{1}{2}$
16) $264\frac{1}{2}$ cu. ft.
Ans. $16\frac{17}{32}$ cd. ft.

175. 2 oz. 10 pwt.
20
50 pwt.

11 lb. 5 oz. 10 pwt.
12
137
20
2750 pwt.

50) 2750
Ans. 55 spoons.

176. 19 quires @ 12 ¢ sell for.....$2.28
1 outside quire sells for..... 0.08
20 quires, or 1 ream, sells for.....$2.36
Cost of 1 ream 1.75
Gain on 1 ream $0.61

Gain on 25 reams = 25 × $0.61 = $15.25, Ans.

177. Mar. 15, 1767, to Mar. 15, 1845, = 78 y.
Mar. 15, 1845, to May 15, 1845, = 2 mo.
May 15, 1845, to June 8, 1845, = 24 d.
Mar. 15, 1767, to June 8, 1845, = 78 y. 2 mo. 24 d., Ans.

178. $\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$, remaining; $\frac{5}{8}$ of $68\frac{1}{2} = \frac{5}{8}$ of $\frac{137}{2} = 42\frac{1}{16}$

$0.72	$0.90	
$68\frac{1}{2}$	$42\frac{1}{16}$	
576	180	
432	360	$49.32, bought for.
36	$73\frac{1}{8}$	$38.53\frac{1}{8}$, sold for.
$49.32	$38.53\frac{1}{8}$	Ans. 10.78\frac{7}{8}$, loss.

179. Since five cents is the same fractional part of 1 dollar as a cental is of 1 ton, any article is worth as many five cent pieces a cental as dollars a ton.

180. 17 rd. 16 ft. 11 in. = 3569 in.
18 rd. 5 in. = 3569 in.
17 rd. 5 yd. 1 ft. 11 in. = 3569 in.
Hence they did not differ.

181. The time from $\frac{1}{4}$ before 6 to $\frac{3}{4}$ past 7 = 2 hours. Hence A would gain 2 hours in 1 day.

Between March 5, 1882, and March 5, 1900, there are 18 years, 14 of which are common years and 4 leap years.

14 com. years = 14 × 365 d. = 5110 d.
4 leap years = 4 × 366 d. = 1464
6574 d.

6574 × 2 h. = 13148 h. = 547 d. 20 h., Ans.

Article 213.

25. 1365 mm = 1.365 m
497 cm = 4.97
145.51 m = 145.51
Ans. 151.845 meters.

26. 15.16 Ha = 1516 a
111.55 a = 111.55
3615 ca = 36.15
Ans. 1663.70 ares.

27. 45.0 st
276 dst = 27.6
17.4 st, Ans.

28. 3.40 Hl
6
20.40 Hl = 2040 l, Ans.

29. 21.080 T = 21080 K
8) 21080 K
2635 K
$0.20
$527.00, Ans.

30. 8.42 Ha
87.25 a = 0.8725
9.2925 Ha
365.50 Ha − 9.2925 Ha =
356.2075 Ha, Ans.

32. 1 kilo = 2.2046 lb.
55 kilos = 55 × 2.2046 lb. =
121.253 lb., Ans.

33. 1 sq m = 1.196 sq. yd.
306 sq m = 306 × 1.196 sq.yd. =
365.976 sq. yd., Ans.

34. 1 Ha = 2.471 acres.
450 Ha = 450 × 2.471 A. = 1111.95 A., Ans.

35. 1 kilo = 2.2046 lb.
196 lb. ÷ 2.2046 lb. = 88.9+ kilos, Ans.

36. 1 bushel = 0.3524 ^{Hl}
210 bu. = 210 × 0.3524 ^{Hl} =
74.004 ^{Hl}, Ans.

38. 1 ^{Hl} = 2.837 bu.
1 bu. cost $0.65
2.837 bu. cost 2.837 × $0.65 =
$1.845+, Ans.

39. 8) 600.58 ^{Ha}
75.0725 ^{Ha}
1 ^{Ha} = 2.471 A.
75.0725 × 2.471 A. = 185.504+ A.
185.504 × $25 = $4637.60+, Ans.

40. 1 mile = 1.6093 ^{Km}.
1607 mi. = 1607 × 1.6093 ^{Km} =
2586.145+ ^{Km}, Ans.

41.
287 ft.	6 in.
19	6
307 ft.	0 in.

1 ft. = 30.48 ^{cm}
307 ft. = 307 × 30.48 ^{cm} =
9357.36 ^{cm}, or 93.5736 ^{m}, Ans.

42. 1 ft. = 30.48 ^{cm}; 3 ft. or 1 yd. = 91.44 ^{cm} or 0.9144 ^{m}
65 yd. = 65 × 0.9144 ^{m} = 59.436 ^{m}
59.436 × $1.20 = $71.32+, cost of carpet.
65 × $1.20 = $78.00, what it sold for.
$78 − $71.32 = $6.68, gain, Ans.

43. A cubic meter has the same capacity as a kiloliter.
40.64 $^{cu\ m}$ = 40.64 ^{Kl}; 1 ^{Hl} = 2.837 bu.; 1 ^{Kl} = 28.37 bu.
40.64 ^{Kl} = 40.64 × 28.37 bu. = 1152.956+ bu.
1152.956 × $0.80 = $922.36, Ans.

Article 222.

6. 46 ft. 3 in. = 46.25 ft.
35 ft. 6 in. = 35.5 ft.

46.25
35.5
23125
23125
13875
2) 1641.875
Ans. 820.9375 sq. ft., or
820 sq. ft. 135 sq. in.

7. 314.16
50
2) 15708.00
Ans. 7854 sq. ft.

8. 3.1416
400
Ans. 1256.6400 ft.

9. 3.1416) 1256.6400
Ans. 400 ft.

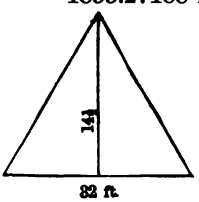
10. 18 ft. = 6 yd.
15 ft. 6 in. = $5\frac{1}{6}$ yd.
$6 \times 5\frac{1}{6} = 31$ sq. yd.
31 sq. yd. $\div$ 1 yd. = 31 yd., Ans.

11. 18.75
18.75
9375
13125
15000
1875
9) 351.5625 sq. ft.
50) 39.0625 sq. yd.
Ans. .78125 yd., or $28\frac{1}{8}$ in.

12. 45
48
360
180
160) 2160 sq. rd.
Ans. $13\frac{1}{2}$ A.

13. 1 meter = 39.37 in.
39.37 in. $\times$ 15 = 47.124 in.
47.124 in. $\times$ 39.37 = 1855.27188 in.
1855.27188 in. $\div$ 12 in. = 154.61 ft. nearly, Ans.

14.



$(32 \times 14\frac{1}{2}) \div 2 = \overset{8}{\cancel{32}} \times \frac{29}{\cancel{2}} \times \frac{1}{\cancel{2}} =$
232 sq. ft., Ans.

15.

564.50
260
3387000
112900
146770.00 sq m

146770.00 sq m ÷ 10000 =
14 Ha 6770 sq m, Ans.

16.

288
12.5
1440
576
288
9) 3600.0 sq. ft.
400. sq. yd.
.60
$ 240.00, Ans.

17. 60 ft. = radius of circle.
60 × 2 = 120 ft., diameter.
120 × 3.1416 = 376.992, circumference.

376.992
60
2) 22619.520
11309.76 sq. ft. = 41 sq. rd. 147+ sq. ft., Ans.

18. 2.5 ft. × 2.5 ft. = 6.25 sq. ft. in bottom.
2.5 × 6 = 15 sq. ft. in 1 side.
15 × 4 = 60 sq. ft. in 4 sides.
60 sq. ft. + 6.25 sq. ft. = 66.25 sq. ft., Ans.

19.

751
348
6008
3004
2253
261348 sq. ft.
4
1045392
160) 959 sq. rd. 260¼ sq. ft.
5 A. 159 sq. rd.

272¼) 4) 1089

Ans. 5 A. 159 sq. rd. 260¼ sq. ft.

9) 1160 3/72 sq. ft.
128 28/72 sq. yd.

20. 2 ft. 6 in. = 30 in.

30
9
270 sq. in. in 1 stone.
75
1350
1890
20250 sq. in. in 75 stones.
8½
162000
5062½
144) 167062½ sq. in.
1160 5/72 sq. ft.
$ 0.20
$ 232.03⅛, cost, Ans.

Article 226.

25. $2\frac{1}{2}$ ft. $= \frac{5}{2}$ ft., 18 in. $= \frac{3}{2}$ ft.; $\frac{5}{2} \times \frac{3}{2} \times \frac{4}{4} = 15$ cu. ft., Ans.

26. 10 ft. 6 in. $= \frac{21}{2}$ ft.; $\frac{21}{2} \times \frac{21}{2} \times \frac{21}{2} = \frac{9261}{8} =$ $1157\frac{5}{8}$ cu. ft., Ans.

27. $13\frac{3}{8} \times 6 = 80\frac{1}{4}$ sq. ft.; $294\frac{1}{4} \div 80\frac{1}{4} = \frac{1177}{4} \times \frac{4}{321} =$ $3\frac{2}{3}$ ft., Ans.

28. 15 decimeters $= 1\frac{1}{2}$ meters; $\frac{3}{2} \times 1 \times \frac{2}{2} = 3$ cu. meters, Ans.

29.

42
60
2520
$8\frac{1}{2}$
20160
1260
27) 21420 cu. ft.
Ans. $793\frac{1}{3}$ cu. yd.

30.

1.45
3
4.35
2
Ans. 8.700 cu. meters.

31. 32 ft. $= 10\frac{2}{3}$ yd.; 3 ft. $= 1$ yd.
1 yd. $\times$ 3.1416 $=$ 3.1416 yd., circumference.
$\frac{1}{2}$ yd. $=$ radius; 3.1416 $\times \frac{1}{2} \div 2 = .7854$ sq. yd., area of base; $.7854 \times 10\frac{2}{3} = 8.3776$ cu. yd., Ans.

32. 4 ft. 6 in. $= 4\frac{1}{2}$ ft.; 6 ft. 4 in. $= 6\frac{1}{3}$ ft.

$4\frac{1}{2} = \frac{9}{2}$, $6\frac{1}{3} = \frac{19}{3}$; $\frac{9}{2} \times \frac{19}{3} \times \frac{6}{6} = 1026$ sq. ft., Ans.

Article 227.

33. $32 \times 8 \times 4 = 1024$ cu. ft.; $1024 \div 128 = 8$ cd., Ans.

34. $4 \times 4 \times 64 = 1024$ cu. ft.; $1024 \div 128 = 8$ cd., Ans.

35. $28 \times 4 \times 6\frac{1}{2} = 728$ cu. ft.; $728 \div 128 = 5\frac{11}{16}$ cd., Ans.

36. $4 \times 56 = 224$; 10 cd. $\times 128 = 1280$ cu. ft.

$1280 \div 224 = 5\frac{5}{7}$ ft., Ans.

37. 3 ft. 6 in. $= 3\frac{1}{2}$ ft., 4 ft. 6 in. $= 4\frac{1}{2}$ ft.

$\frac{7}{2} \times \frac{9}{2} \times 4 \times 2 = 126$ cu. ft.; $126 \div 128 = \frac{63}{64}$ cd., Ans.

38. $30 \times 16 \times 12 = 5760$ cu. ft.; $5760 \div 128 = 45$ cd.

$\$5.25 \times 45 = \$236.25$, Ans.

Article 230.

40. 1 ft. 6 in. $= \frac{3}{2}$ ft.; $\overset{8}{16} \times \frac{3}{2} = 24$ bd. ft., Ans.

41. 16 in. $= \frac{4}{3}$ ft.; $\overset{10}{20} \times \frac{4}{3} \times \frac{5}{2} = 66\frac{2}{3}$ bd. ft., Ans.

42. $18 + 16 = 34$; $\frac{34}{2} = 17$ in. $= \frac{17}{12}$ ft.; $\overset{5}{20} \times 10 \times \frac{17}{\frac{12}{3}} =$

$283\frac{1}{3}$ bd. ft., Ans

43. 9 in. $= \frac{3}{4}$ ft.; $\overset{11}{44} \times 18 \times 3 \times \frac{3}{4} = 1782$ bd. ft.

$$\frac{1782 \times \$23}{1000} = \$40.986., \text{ Ans.}$$

44. 21 in. $= \frac{7}{4}$ ft.; $18 \times \overset{6}{\cancel{24}} \times 2 \times \frac{7}{\cancel{4}} = 1512$ bd. ft.

$$\frac{1512 \times \$\,35}{1000} = \$\,52.92, \text{ Ans.}$$

MISCELLANEOUS EXERCISES.

45. $9432 \div 131 = 72$ ft., Ans.

46. $\overset{4}{\cancel{8}} \times 3 \times \frac{11}{\cancel{2}} = 132$ cu. ft.; $132 \div 128 = 1\frac{1}{32}$ cd.

$\$\,5.50 \times 1\frac{1}{32} = \$\,5.67+$, Ans.

47. 30 ft. 6 in. $= \frac{61}{2}$ ft.; $20 \times \frac{61}{\cancel{2}} \times \cancel{2} = 1220$ bd. ft., Ans.

48. $28 + 20 = 48$ in.; $\frac{1}{2}$ of 48 in. $= 24$ in., or 2 ft.

$6 \times 16 \times 2 = 192$ bd. ft.; $\frac{192 \times \$\,40}{1000} = \$\,7.68$, Ans.

49. $90^{\text{cm}} = 0.9^{\text{m}}$; $110^{\text{cm}} = 1.1^{\text{m}}$; $2.50 \times 0.9 \times 1.1 = 2.475^{\text{cu m}}$;

$2.475^{\text{cu m}} = 2.475^{\text{Kl}} = 24.75^{\text{Hl}}$, Ans.

50. $18 \times 9 \times 2 = 324$ sq. ft. in sides.

$12 \times 9 \times 2 = 216$ sq. ft. in ends.

$\overline{540}$ sq. ft. in walls.

1 ft. 8 in. $= \frac{5}{3}$ ft.; 12 yd. $= 36$ ft.

$\overset{12}{\cancel{36}} \times \frac{5}{\cancel{3}} = 60$ sq. ft. in 1 roll of paper.

$540 \div 60 = 9$ rolls, Ans.

51.

$4 \times 3 \times 4 = 48$

$.8$

Ans. 38.4 bu.

52.

2 ft. 6 in. $= \frac{5}{2}$ ft; 1 ft. 9 in. $= \frac{7}{4}$ ft.

$\frac{5}{2} \times \frac{7}{4} \times 2 = 8\frac{3}{4}$ cu. ft.

$8\frac{3}{4} \times 7\frac{1}{2} = \frac{35}{4} \times \frac{15}{2} = \frac{525}{8} = 65\frac{5}{8}$ gal., Ans.

53. 12 ft. 6 in. $= 12\frac{1}{2}$ ft.; $40 \times 12\frac{1}{2} = 500$ sq. ft.
$8\frac{1}{2}$ in. $\times 2 = 17$; $500 \times 17 = 8500$ bricks, Ans.

54. $8 \times 5 \times 4 = 160$ cu. ft.; 1 ton of Lehigh fills 40 cu. ft.
$160 \div 40 = 4$ tons of Lehigh; 1 ton of Lackawanna fills 45 cu. ft.; $160 \div 45 = 3\frac{5}{9}$ tons of Lackawanna.

55. 4840 sq. in. $= \frac{4840}{144}$ sq. ft.; $3\frac{1}{3}$ ft. $= \frac{10}{3}$ ft.

$\frac{\cancel{4840}^{605}}{\cancel{144}} \times \frac{\cancel{10}^{5}}{3} = \frac{3025}{27} = 112\frac{1}{27}$ cu. ft.

$112\frac{1}{27} \times 1000 = 112037\frac{1}{27}$ oz.

$112037\frac{1}{27} \div 16 = 7002\frac{17}{432}$ lb., Ans.

56. 18 in. $= 1\frac{1}{2}$ ft.; $33 + 30 = 63$; $63 \times 2 = 126$ ft.
$126 \times 9 = 1134$ sq. ft. in walls.
$1134 \times 1\frac{1}{2} = 1701$ cu. ft. in walls.

$\frac{3}{2} \times \frac{3}{2} \times 4 = 9$; $9 \times 9 = 81$ cu. ft. in corners.

$1701 + 81 = 1782$ cu. ft., Ans.

Article 231.

50.

$1116 = 2 \times 2 \times 3 \times 3 \times 31$

$1364 = 2 \times 2 \times 11 \times 31$

$2 \times 2 \times 31 = 124$, greatest com. divisor.

$2 \times 2 \times 3 \times 3 \times 11 \times 31 = 12276$, least c. m.

$12276 \div 124 = 99$, Ans.

51.

$.008$

$.06$

$16.) \overline{.00048}$

Ans. $.003$

52. $160\overline{)3.00000}$
.01875, Ans.

53. $7\overline{)3.00}$
$.42\frac{6}{7}$, Ans.

54. 1 mi. = 5280 ft.
10 mi. = 10×5280 ft. = 52800ft.

52800
4
$33\overline{)211200}$ ft.
Ans. 6400 rails.

55. $3\frac{11}{18} = \frac{65}{18}$; $28 \div \frac{56}{15} = \cancel{28} \times \frac{15}{\cancel{56}} = \$\ 7\frac{1}{2}$, cost of 1 ton.

$17.65 \times \$\ 7\frac{1}{2} = \$\ 132.375$, Ans.

56. $\frac{3}{5}$ = land; $\frac{2}{5}$ = house; $\frac{5}{5} + \frac{2}{5} = \frac{7}{5} = \$\ 14000$.

$\frac{5}{5} = \$\ 14000 \div \frac{7}{5} = \$\ 10000$; $\frac{2}{5}$ of $\$\ 10000 = \$\ 4000$, Ans.

57. 1 sq. m. = 640 A.; $\frac{2}{\cancel{5}}$ of $\overset{128}{\cancel{640}} = 256$; $\frac{1}{\cancel{4}}$ of $\overset{160}{\cancel{640}} = 160$.

$256 + 160 + 100 = 516$ A.; $640 - 516 = 124$ A., Ans.

58. $\$\ 570 + \$\ 80 = \$\ 650$.
$\frac{2}{5} = \$\ 650$.
$\frac{5}{5} = \frac{\overset{325}{\cancel{650}}}{\cancel{2}} \times 5 = \$\ 1625$ in bank.
$\$\ 570 + \$\ 1625 = \$\ 2195$, Ans.

59. 10 mi. = 52800 ft.
320 ft.
300
620
2
1240 ft.) 52800 ft.
Ans. $42\frac{18}{31}$.

60.

$144\overline{)20000}$ sq. in.
$9\overline{)138}$ sq. ft. 128 sq. in.
15 sq. yd. 3 sq. ft.
Ans. 15 sq. yd. 3 sq. ft. 128 sq. in.

61.

$28 \times 15 = 420$ sq. ft.
420 sq. ft. = $46\frac{2}{3}$ sq. yd.
$46\frac{2}{3} \div \frac{3}{4} = \frac{140}{3} \times \frac{4}{3} = \frac{560}{9} =$
$62\frac{2}{9}$ yd., Ans.

62. 1 A. = 43560 sq. ft.; 43560 ft. × 1 = 43560 cu. ft.

43560 cu. ft. = 1613⅓ cu. yd., Ans.

63. 8 in. × 4 in. = 32 sq. in. = ⅔ sq. ft.

¼ mi., or 1320 ft. × 8 ft. = 10560 sq. ft.

$$10560 \div \frac{2}{9} = 47520 \text{ bricks, Ans.}$$

64. 8 × 2 = 16 sq. in. = ⅑ sq. ft.; ¼ mi. = 1320 ft.

$$1320 \times 8 = 10560 \text{ sq. ft.}; \quad 10560 \div \frac{1}{9} = 95040 \text{ bricks, Ans.}$$

65. 20 × 20 = 400 sq. rd. in square.

3.1416
20
62.8320, circumference of circle.
10, radius.
2) 628.3200
314.16 sq. rd. in circle.

400 sq. rd. − 314.16 = 85.84 sq. rd., Ans.

66. ¼ A. = 10890 sq. ft.
10890 × 1 = 10890 cu. ft.
10890 × 930 = 10127700 oz.

16) 10127700 oz.
2000) 632981¼ lb.
Ans. 316$\frac{147}{320}$ T.

67. 30 in. = ⅚ yd.; $\frac{5}{6} \times 45 = \frac{225}{6} = 37\frac{1}{2}$ sq. yd., Ans.

68. 1 hektoliter = 26.417 gal.; \$ 5.00 × 26.417 = \$ 132.08⅓.

\$ 132.08⅓ − \$ 100 = \$ 32.08⅓ gain, Ans.

69.

200 ÷ 50 = 4 lots; 5 × 150 = 750 ft.; 2 × 200 = 400 ft.
400 + 750 = 1150 ft. of fence; \$ 0.16⅔ per rod = 1¢ per ft.

1150 × 1¢ = \$ 11.50, Ans.

70. 5 ft. $\times$ 3.1416 = 15.708 ft., circumference.
1 mi. = 5280 ft.; 26 mi. = 26 $\times$ 5280 ft. = 137280 ft.
137280 ft. $\div$ 15.708 ft. = $8739\frac{49}{1571}$ times, Ans.

71. $12 \times 40 \times 8\frac{3}{4} = 4200$ cu. ft.; $4200 \div 128 = 32\frac{13}{16}$ cd., Ans.

72. 1 rd. 8 ft. = $\frac{49}{2}$ ft.; $\frac{3}{4}$ rd. = $\frac{99}{8}$ ft.

$$\frac{49}{2} \times \frac{99}{8} = \frac{4851}{16} = 303\frac{3}{16} \text{ sq. ft., Ans.}$$

73. 32 ft. 8 in. = $32\frac{2}{3}$ ft.; $32\frac{2}{3} \times 55 = 1796\frac{2}{3}$ sq. ft.
$1796\frac{2}{3} \div 8 = 224\frac{7}{12}$ ft. = $74\frac{31}{36}$ yd., Ans.

74. 1 mi. = 5280 ft.; $\frac{3}{4}$ mi. = 3960 ft.
$3960 \times 60 = 237600$ sq. ft.; 1 A. = 43560 sq. ft.
$237600 \div 43560 = 5\frac{5}{11}$ A., Ans.

75. $(20 + 20) \times 2 = 80$ ft.; $80 \times 12 = 960$ sq. ft. in walls.
$20 \times 20 = 400$ sq. ft. in ceiling; $960 + 400 = 1360$ sq. ft.
$\frac{1}{5}$ of 1360 = 272 sq. ft.; $1360 - 272 = 1088$ sq. ft.
1088 sq. ft. = $120\frac{8}{9}$ sq. yd.
$120\frac{8}{9} \times \$0.16\frac{2}{3} = \$20.14\frac{2}{27}$, Ans.

76. $20 \times 20 = 400$ bd. ft.; $\frac{1}{11} = 400$ bd. ft.

$$\frac{1}{11} = \frac{400}{10} \times 11 = 440 \text{ bd. ft.} \quad \frac{440 \times \$\ 35}{1000} = \$15.40, \text{ Ans.}$$

77. $17.28 \div .083\frac{1}{3} = 207.36$

$$\frac{7\frac{1}{2}}{3000} = \frac{15}{2} \times \frac{1}{\cancel{3000}\ 200} = \frac{1}{400} = 0.0025$$

$207.36 \times 0.0025 = 0.5184$, Ans.

78. 1 day = 24 h.; 3 P. M. = 15 h. from midnight.

$$\frac{15}{24} = \frac{5}{8} = 0.625, \text{ Ans.}$$

79. $(16 + 14) \times 2 = 60$ ft., perimeter.
$60 \times 8 = 480$ sq. ft. in walls.
$2 \times 3 = 6$ sq. ft. in 1 yd. of paper; $480 \div 6 =$ 80 yards, Ans.

80. 3.15 P.M., Aug. 3, is 33 d. 15 h. 15 min. from the beginning of July 1st.

33 d. 15 h. 15 min.
7 15 30
25 d. 23 h. 45 min.

25 d. 23 h. 45 min. from July 1 is July 26, 11.45 P.M., Ans.

81. 3 in. $= \frac{1}{4}$ ft.; $\overset{75}{\cancel{300}} \times \frac{1}{\cancel{4}} = 75$ sq. ft.; 75 sq. ft. $=$ $8\frac{1}{3}$ sq. yd., Ans.

82. 1 pt. $\div 2 = \frac{1}{2}$ qt.; $3\frac{1}{2}$ qt. $= \frac{7}{2} \div 4 = \frac{7}{8}$ gal.

$18\frac{7}{8} \times \$0.45 = \$8.49\frac{3}{8}$, Ans.

83.

$0.7\frac{3}{8} = \frac{59}{8} \times \frac{1}{10} = \frac{59}{80}$; $\frac{7}{10} + \frac{3}{8} = \frac{86}{80}$; $\frac{86}{80} - \frac{59}{80} = \frac{27}{80}$, Ans.

84. 1 A. $= 160$ sq. rd.; 8 rd. sq. $= 64$ sq. rd.
$64 + 8 = 72$ sq. rd; $160 - 72 = 88$ sq. rd., Ans.

85. $4\frac{1}{2} \times 128$ cu. ft. $= 576$ cu. ft.; 5 ft. 6 in. $= \frac{11}{2}$ ft.

$\frac{9}{2} \times \frac{11}{2} = \frac{99}{4}$ sq. ft.; $576 \div \frac{99}{4} = \overset{64}{\cancel{576}} \times \frac{4}{\underset{11}{\cancel{99}}} = 23\frac{3}{11}$ ft., Ans.

86. $\overset{20}{\cancel{80}} \times \frac{3}{\cancel{4}} = 60$ sq. yd.; $60 \times 9 = 540$ sq. ft.
$540 \div 30 = 18$ ft., Ans.

87. 1 A. = 43560 sq. ft.; 5 A. = 217800 sq. ft.
217800 ÷ 600 = 363 ft. wide; (600 + 363), or 963, × 2 = 1926 ft., Ans.

88. 18 in. = $\frac{3}{2}$ ft.; 40 in. = $\frac{10}{3}$ ft.; $\frac{2}{1} \times \frac{3}{2} \times 56 = 168$ sq. ft.

$$168 \div \frac{10}{3} = 50\frac{2}{5} \text{ ft.} = 16\frac{4}{5} \text{ yd., Ans.}$$

89. 1 cu. yd. = 1728 cu. in. × 27 = 46656 cu. in.
1 2-inch cube = 8 cu. in.; 46656 ÷ 8 = 5832, Ans.

90. 20 in. = $1\frac{2}{3}$ ft.; $15 \times 1\frac{2}{3} \times 20 = 500$ bd. ft.
.05 of 500 = 25 ft.; 500 ft. − 25 ft. = 475 ft., Ans.

91. 90 rd. sq. = 8100 sq. rd.; 8100 − 90 = 8010 sq. rd.
8010 ÷ 160 = $50\frac{1}{16}$ A.; \$240 × $50\frac{1}{16}$ = \$12015, Ans.

92. $9\frac{1}{7} - 3\frac{3}{5} = 5\frac{12}{35}$; $\frac{5\frac{12}{35}}{9\frac{1}{7}} = \frac{\overset{97}{\cancel{194}}}{\underset{5}{\cancel{35}}} \times \frac{\overset{7}{\cancel{64}}}{\underset{32}{\cancel{64}}} = \frac{97}{160}$, Ans.

93. 12 rd. = 198 ft.; 10 rd. = 165 ft.
(198 + 165), or 363, × 2 = 726 ft.; 726 × 6 = 4356 sq. ft.
6 × 6, or 36, × 4 = 144 sq. ft. in corners.
4356 − 144 = 4212 sq. ft. = 468 sq. yd.
\$0.75 × 468 = \$351, Ans.

94. (240 + 160) × 2 = 800 ft.
800 × 6 = 4800 sq. ft. on 1 side.
4800 × 2 = 9600 sq. ft. on 2 sides.
9600 sq. ft. ÷ 9 = $1066\frac{2}{3}$ sq. yd.
$1066\frac{2}{3}$ × \$0.05 = \$53.33$\frac{1}{3}$, Ans.

95. Feb. = 24 d. 1 h. 30 min.
Mar. = 31
Apr. = 30
May = 10 3 h. 40 min.
Ans. 95 d. 5 h. 10 min.

96.

$$9 \times \frac{5}{4} \times \overset{225}{\cancel{900}} = 10125 \text{ sq. yd.}; \quad 10125 \div \frac{3}{4} = \overset{3375}{\cancel{10125}} \times \frac{4}{\cancel{3}} =$$

13500 yd., Ans.

97. $30 \times 27 = 810$ sq. ft.; $810 \div 9 = 90$ sq. yd.
$90 \div 1 = 90$ yd.; $90 \times \$1.25 = \$112.50$
$90 \div \frac{3}{4} = 120$ yd.; $120 \times \$1 = \$120$
$\$120 - \$112.50 = \$7.50$. Ans. Yard wide; $\$7.50$.

98. $2 \times 1 \times 1.4 = 2.8^{\text{cu m}}$; $2.8^{\text{cu m}} = 2.8^{\text{Kl}} = 28^{\text{Hl}}$
$28 \times 75^{\text{K}} = 2100^{\text{K}} = 2.1^{\text{T}}$, Ans.

99.

$112 \times 25 \times 2 = 5600$ sq. ft.; $5600 \times 10 = 56000$ shingles
$56.000 \times \$6.50 = \$364$, Ans.

100. $\$0.18\frac{3}{4} \times 12 = \$2.25$, Ans.

101. $14\frac{7}{8} \times 5\frac{5}{8} = \frac{119}{8} \times \frac{45}{8} = \$83\frac{43}{64}$

$12\frac{3}{4} \times 6\frac{1}{2} = \frac{51}{4} \times \frac{13}{2} = \$82\frac{7}{8}$

$14\frac{7}{8} + 12\frac{3}{4} = 27\frac{5}{8}$; $27\frac{5}{8} \times \$0.25 = \$6\frac{29}{32}$

$\$83\frac{43}{64} + \$82\frac{7}{8} + \$6\frac{29}{32} = \$173\frac{29}{64} = \$173.45\frac{5}{16}$, Ans.

102. $3\frac{1}{3} \times 4\frac{1}{5} = \frac{10}{3} \times \frac{37}{9} = \frac{370}{27}$

$\frac{37}{9} - \frac{10}{3} = \frac{37}{9} - \frac{30}{9} = \frac{7}{9}$; $\frac{1}{2}$ of $\frac{7}{9} = \frac{7}{18}$

$\frac{370}{27} - \frac{7}{18} = \frac{740}{54} - \frac{21}{54} = \frac{719}{54} = 13\frac{17}{54}$, Ans.

103. $19\frac{3}{8} \div 17\frac{1}{2} = \$\frac{31}{28}$; $\frac{4}{5}$ of $\frac{31}{28} = \$\frac{31}{35} = \$0.88\frac{4}{7}$, Ans.

104. 1 yd. sells for $\$\frac{3}{4}$; $\frac{6}{8}$ yd. sells for $\frac{6}{8} \times \$\frac{3}{4} = \$\frac{6}{8}$.
$\$\frac{6}{8} - \$\frac{1}{2} = \$\frac{1}{2}$, cost of $\frac{6}{8}$ yd. $\$\frac{1}{2} \times \frac{6}{5} = \$\frac{6}{10}$, cost of 1 yd.
$\frac{7}{8}$ of $\$\frac{6}{10} = \$\frac{21}{40} = \$0.52\frac{1}{2}$, cost of $\frac{7}{8}$ yd., Ans.

Article 241.

35. $\$2575 \times .40 = \$1030$; $\$2575 + \$1030 = \$3605$, Ans.

36. $\$1890 \times .83\frac{1}{3} = \$1575$; $\$1890 - \$1575 = \$315$, Ans.

Article 242.

37.
$8500 \times .28 = 2380$ T., Ans.

38.
$6840 \times .03 = 205.20$ gal., Ans.

39.
$2584 \times .00\frac{7}{8} = 22.61$ mi., Ans.

40.
$3460 \times .35 = 1211$ men, Ans.

41.
$\$5000 \times .09\frac{3}{4} = \$487.50$, Ans.

42.
$\$645.50 \times .08 = \$51.64$, Ans.

43.
$\$13.56 \times .06 = \$0.8136$, Ans.

44.
$\$817.68 \times .62\frac{1}{2} = \$511.05$, Ans.

45. $100\% - 15\% = 85\%$; $\$4850 \times .85 = \$4122.50$, Ans.

46. $100\% + 16\% = 116\%$; $\$9675.75 \times 1.16 = \$11223.87$, Ans.

47.

$\$186.80 \times .05 = \$9.34$, Ans.

48.

$61450 \times .24 = 14748$, Ans.

49.

$\$4500 \times 2.85 = \$12825$, Ans.

50.

$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%$

$\$8550 \times .66\frac{2}{3} = \$5700$, Ans.

51. $100\% + 15\% = 115\%$; $\$345.75 \times 1.15 = \$397.6125$

$100\% - 15\% = 85\%$; $\$397.6125 \times .85 = \$337.97$, Ans.

64. $\frac{57}{600} = \frac{19}{200} = .09\frac{1}{2}$, or $9\frac{1}{2}\%$, Ans.

Article 243.

65. $\frac{18275}{215000} = \frac{731}{8600} = .08\frac{1}{2}$, or $8\frac{1}{2}\%$, Ans.

66. $\frac{8}{130} = \frac{4}{65} = .06\frac{2}{13}$, or $6\frac{2}{13}\%$, Ans.

67. $\frac{160}{625} = \frac{32}{125} = .25\frac{3}{5}$, or $25\frac{3}{5}\%$, Ans.

68. $\frac{490}{5000} = \frac{49}{500} = .09\frac{4}{5}$, or $9\frac{4}{5}\%$, Ans.

69. $\frac{600}{720} = \frac{5}{6} = .83\frac{1}{3}$, or $83\frac{1}{3}\%$, Ans.

70 $\frac{70}{500} = \frac{7}{50} = .14$, or 14%, Ans.

71. $\frac{85}{1700} = \frac{1}{20} = .05$, or 5%, Ans.

72. $\frac{57375}{765000} = \frac{51}{680} = .07\frac{1}{2}$, or $7\frac{1}{2}\%$, Ans.

73. $\frac{246}{1640} = \frac{123}{820} = .15$, or 15%, Ans.

74. $\frac{16825}{134600} = \frac{673}{5384} = .12\frac{1}{2}$, or $12\frac{1}{2}\%$, Ans.

82. $\frac{\$16.22}{\cancel{5}} \times \frac{20}{\cancel{100}} = \$324.40$, Ans.

83. $100\% - 40\% = 60\%$; $\frac{\cancel{177}^{59}}{\cancel{60}_{\cancel{3}}} \times \frac{5}{\cancel{100}} = 295$ sheep, Ans.

Article 244.

84.

$\frac{\$125}{\cancel{8}_{2}} \times \frac{25}{\cancel{100}} = \$1562.50$, Ans.

85.

$\frac{.108}{.75} \times 100 = 14.4$ tons, Ans.

86.

$\frac{\cancel{16}^{2}}{\cancel{24}_{3}} \times 100 = 66\frac{2}{3}$ bu., Ans.

87.

$\frac{7.80}{.75} \times 100 = 1040$ yd., Ans.

88. $\frac{21.6}{.66\frac{2}{3}} = 32.4$; $32.4 \times 100 = 3240$ rd., Ans.

89. $\frac{\$14}{.4} = \$35$; $\$35 \times 100 = \$3500$, Ans.

90. $\frac{1750}{25} \times \frac{4}{100} = 7000$ lb., Ans.

91. $100\% - 40\% = 60\%$; $\frac{250}{60} \times \frac{5}{100} = \$416\frac{2}{3}$.

$\$416\frac{2}{3} - \$250 = \$166\frac{2}{3}$, Ans.

92.

$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%$; $\frac{\$1600}{66\frac{2}{3}} \times 100 = \$2400$, Ans.

93. $\frac{\$6750}{75} \times \frac{4}{100} = \$9000$, Ans.

94. $100\% + 20\% = 120\%$; $\frac{16386}{120} \times \frac{5}{100} = 13655$, Ans.

Article 246.

102.

$\$7.75 \times .20 = \$1.55$, Ans.

103.

$\$18240 \times .66\frac{2}{3} = \$12160$, Ans.

104.

$\$400 \times .25 = \$100$, loss; $\$400 - \$100 = \$300$, remainder.
$\$300 \times .16\frac{2}{3} = \$50$, gain; $\$100 - \$50 = \$50$, loss, Ans.

105.

$\$69.60 \times .15 = \$10.44$, Ans.

106.

$\$350.50 \times .06\frac{1}{2} = \$22.78\frac{1}{4}$, Ans.

107. $\$3500 \times 1.08 = \$3780$, Ans.

108. $100\% - 16\% = 84\%$; $\frac{\$\,21\cancel{0}}{\cancel{84}\ 21} \times \frac{25}{\cancel{100}} = \$\,250$, Ans.

109.

$\$\,2550 - \$\,2400 = \$\,150$, gain; $\frac{\cancel{150}}{\cancel{2400}\ 24\ 12}$ of $\cancel{100}\% = 6\frac{1}{4}\%$, Ans.

110. $12 - 8\frac{1}{2} = 3\frac{1}{2}$ cents; $\frac{3\frac{1}{2}}{8\frac{1}{2}} = \frac{7}{17}$ of $100\% = 41\frac{3}{17}\%$, Ans.

111. $\$\,3312.70 = 105\frac{1}{2}\%$; $\frac{\$\,3312.70}{105\frac{1}{2}} \times 100 = \$\,3140$, Ans.

112. $100\% - 12\frac{1}{2}\% = 87\frac{1}{2}\%$; $\$\,560 \times .87\frac{1}{2} = \$\,490$, Ans.

113. $\$\,7.50 \times .06 = \$\,0.45$; $\$\,7.50 + \$\,0.45 = \$\,7.95$.
$\$\,7.95 \times 1.05 = \$\,8.34\frac{3}{4}$, Ans.

114. $\$\,1600 \times .20 = \$\,320$; $\frac{1}{4}$ of $\$\,1600 = \$\,400$.
$\$\,400 \times .15 = \$\,60$; $\$\,1600 - \$\,400 = \$\,1200$.
$\$\,320 - \$\,60 = \$\,260$; $\$\,1200 + \$\,260 = \$\,1460$, Ans.

115.

$\$\,28 = 112\%$; $\frac{\$\,\cancel{28}}{\cancel{112}\ 4} \times \frac{25}{\cancel{100}} = \$\,25$, cost; $\$\,25 - \$\,24 = \$\,1$, loss.

$\frac{1}{\cancel{25}}$ of $\overset{4}{\cancel{100}}\% = 4\%$ loss, Ans.

116. $\$\,50 \times 1.10 = \$\,55$; $\frac{4}{5}$ of $\overset{24}{\cancel{120}} = 96$ gal.
$\$\,55 \div 96 = \$\,0.57\frac{7}{24}$, Ans.

117. $\$15 = 90\%$; $\frac{\$15}{90} \times 100 = \$16\frac{2}{3}$, cost.

$\$16\frac{2}{3} \times 1.15 = \$19.16\frac{2}{3}$, Ans.

118. $\$150 = 90\%$; $\frac{\$150}{90} \times 100 = \$166\frac{2}{3}$, cost.

$\$166\frac{2}{3} \times 1.30 = \$216\frac{2}{3}$; $\$216\frac{2}{3} - \$150 = \$66\frac{2}{3}$, Ans.

119. $\$7250 \times .80 = \$5800$; $\$7250 \times 1.20 = \$8700$.

$\$5800 + \$8700 = \$14500$. Neither gain nor lose, Ans.

Article 248.

123.

$\$5678 \times .02\frac{1}{2} = \$141.95$, Ans.

124.

$\$3500 \times .00\frac{1}{4} = \$8.75$, Ans.

125. $\$7896.50 \times .02 = \$157.93$, Ans.

126. $368 \times \$6.50 = \$2392$; $\$2392 \times .02\frac{1}{2} = \$59.80$, Ans.

127.

$\$5000 \times .00\frac{1}{4} = \$12.50$; $\$5000 + \$12.50 = \$5012.50$, Ans.

128. $\$13500 \times .02\frac{1}{2} = \$337.50$; $\$13500 \times .02 = \$270$.

$\$337.50 + \$270 + \$16.50 = \$624$.

$\$13500 - \$624 = \$12876$, Ans.

130.

$\$650 = 100\% + 3\% = 103\%$; $\frac{\$650}{103} \times 100 = \$631.06+$.

$\$650 - \$631.06 = \$18.94$, Ans.

131.

$\$1426.80 = 100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$; $\frac{\$1426.80}{102\frac{1}{2}} \times 100 = \$1392$.

$\$1392 \div \$6.50 = 214\frac{2}{13}$ bbl., Ans.

132. $\$1392 \times 1.02\frac{1}{2} = \$1426.80$, Ans.

133. $\$334.75 - \$22.75 = \$312$, commission.

$$\frac{312}{8134.75} = 3.83+\%, \text{ Ans.}$$

134.

$\$950 \times .65 = \$617.50$; $\$617.50 \times .06\frac{1}{2} = \$38.59$, Ans.

135. $\$208.50 \div .05 = \$4170$, Ans.

136.

$\$4100 = 102\frac{1}{2}\%$; $\frac{\$4100}{102\frac{1}{2}} \times 100 = \$4000$, for purchase of iron.

$\$4000 \times .02\frac{1}{2} = \$100$, commission.
$\$4000 - \$100 = \$3900$, balance.
$\$4100 - \$3900 = \$200$, loss, Ans.

Article 252.

139. $\$3600 \times .02 = \$72$; $\$72 + \$1 = \$73$, Ans.

140. $\$5545 \times .02\frac{1}{4} = \$124.76$, Ans.

141. $\frac{3}{4}$ of $\$68000 = \$51000$; $\$51000 \times .03 = \$1530$.
$\$1530 + \$1 = \$1531$, Ans.

142.

$\$55000 \times .02\frac{1}{2} = \$1375$; $\$55000 - \$1375 = \$53625$, Ans.

143. $\$27 \div .01\frac{1}{2} = \$1800$; $\$1800 = \frac{3}{4}$ of the value.
$\$1800 \div \frac{3}{4} = \$2400$, Ans.

144. $\$73 - \$1 = \$72$; $\$72 \div \$3600 = .02$, or 2%, Ans.

145. $74 - 44 = 30$ years; $\$26.50 \times 15 = \$397.50$.
$\$397.50 \times 30 = \$11925$; $\$15000 - \$11925 = \$3075$, Ans.

MISCELLANEOUS EXERCISES.

146. $\frac{1}{8}\% = .00125$
$5\% = .05$
$24\% = .24$
$55\% = .55$
$.84125 = 60.25$
$60.25 \div .84125 = 71\frac{41}{673}$, Ans.

147. $37 + 3 = 40$ parts.
$\frac{37}{\cancel{40}_{2}}$ of $\cancel{100}^{5}\% = 92\frac{1}{2}\%$, Ans.
$\frac{3}{\cancel{40}_{2}}$ of $\cancel{100}^{5}\% = 7\frac{1}{2}\%$, Ans.

148. $\$275 + \$180 + \$150 = \$605$; $\$950 - \$605 = \$345$.
$\frac{345}{950}$ of $100\% = 36\frac{8}{19}\%$, Ans.

149.
$\frac{150}{2} = \$0.75$; $\frac{150}{3} = \$0.50$; $\$0.75 + \$0.50 = \$1.25$, cost.
$150 + 150 = 300$; $\frac{\cancel{300}^{60}}{\cancel{5}} \times 2 = \$1.20$, sold for.
$\$1.25 - \$1.20 = \$0.05$, loss, Ans.

150. $\$10 \div 12 = \$0.83\frac{1}{3}$, cost of 1 book.
$\$1.75 - \$0.83\frac{1}{3} = \$0.91\frac{2}{3}$, gain on 1 book.
$\frac{91\frac{2}{3}}{83\frac{1}{3}} = \frac{11}{10}$ of $100 = 110\%$, gain, Ans.

151. $100\% - 25\% = 75\%$; $\$1540 \times .75 = \$1155$.
$100\% - 5\% = 95\%$; $\$1155 \times .95 = \$1097.25$, Ans

152. $100\% + 5\% = 105\%$; $\$603.75 \div 1.05 = \$575$.
$\$575 \div \$5 = 115$ barrels, Ans.

153. $\$17.25 = 15\%$; $\$17.25 \div .15 = \$115$, Ans.

154. 100% − 2% = 98%; $25640 ÷ 0.98 = $26163.26, Ans.

155. $4.25 × .25 = $1.06¼; $4.25 + $1.06¼ = $5.31¼, Ans.

156. $5 × 80 = $400, cost; 100% − 10% = 90%.
80 × .90 = 72 tons; $400 ÷ 72 = $5⅝, Ans.

157. 4500 × $1.20 = $54200, cost.
10% of 4500 bu. = 450 bu.; 3% of $1.20 = $0.036.
$1.20 − $0.036 = $1.164; 450 × $1.164 = $523.80.
50% of 4500 bu. = 2250 bu.; 10% of $1.20 = $0.12.
$120 + $0.12 = $1.32; 2250 × $1.32 = $2970.
50% + 10% = 60%; 100% − 60% = 40%.
40% of 4500 bu. = 1800 bu.; 5% of $1.20 = $0.06.
$1.20 + $0.06 = $1.26; 1800 × $1.26 = $2268.
$523.80 + $2970 + $2268 = $5761.80.
$5761.80 − $5400 = $361.80, gain, Ans.

158. $6000 = 66⅔%; $\frac{\$6000}{66\frac{2}{3}} \times 100 = \$9000$, cost.
$9000 − $6000 = $3000, loss; $3000 = 32%.

$$\frac{\$3000}{\cancel{32}_{8}} \times \overset{25}{\cancel{100}} = \$9375, \text{ cost of 2d house.}$$

$9375 + $3000 = $12375, Ans.

159. $\frac{104513}{1652000}$ of 100% = $6\frac{53933}{165200}$%, Ans.

160. $13195 = 101½; $\frac{\$13195}{101\frac{1}{2}} \times 100 = \$13000$.
$13195 − $13000 = $195, Ans.

161. $\frac{3}{4}$ of $\overset{3000}{\cancel{12000}} = \$9000$; $9000 × .00⅜ = $33.75.
$12000 − $9000 = $3000; $33.75 + $3000 = $3033.75, Ans.

162. $\$23.25 \div \$930 = .02\frac{1}{2}$, or $2\frac{1}{2}\%$, Ans.

163. $100\% - 2\frac{1}{2}\% = 97\frac{1}{2}\% = 0.975$; $\$4387.50 \div 0.975 = \$4500$, Ans.

164. $\$11500 \times .02\frac{1}{2} = \$287.50$; $\$11500 \times .02\frac{1}{2} = \$287.50$.
$\$287.50 + \$287.50 + \$35 + \$17.25 = \$627.25$.
$\$11500 - \$627.25 = \$10872.75$, Ans.

165. $\$1400 \times .25 = \$350$, gain; $\$1400 \times .90 = \$1260$.
$\$1400 - \$1260 = \$140$, loss.
$\$350 - \$140 = \$210$, actual gain.
$\$1400 - \$350 = \$1050$, original value.
$\$210 \div \$1050 = 20\%$, actual gain %, Ans.

166. $100\% - 8\frac{1}{3}\% = 91\frac{1}{3}\%$; $\$920 = 91\frac{1}{3}\%$.

$$\frac{\$920}{91\frac{1}{3}} \times 100 = \$1008.77\frac{1}{17}, \text{ Ans.}$$

167. $24 \times .50 = 12$ ft.; $24 \times 12 = 288$ sq. ft.

288 sq. ft. $= 32$ sq. yd.; $32 \div \frac{3}{4} = 42\frac{2}{3}$ yd., Ans.

168. $100\% - 11\% = 89\%$; 133.5 bbl. $= 89\%$.
133.5 bbl. $\div .89 = 150$ bbl., had at first.
$150 \times \$2.50 = \$375$, cost.
$\$375 \div 133.5 = \$2.80\frac{80}{89}$, per bbl., Ans.

169. $500 \times \$10 = \$5000$; $\$5000 - \$4750 = \$250$.

$$\frac{250}{5000} = \frac{1}{20} \text{ of } 100\ \% = 5\ \%, \text{ Ans.}$$

170. $\$8000 \times .01\frac{1}{2} = \$120$; $\$15000 \times .00\frac{3}{5} = \$90$.
$\$120 + \$90 = \$210$; $\$15000 + \$8000 = \$23000$.
$\$23000 - \$210 = \$22790$, Ans.

171. $55\% - 24\% = 31\%$; $60.45 = 31\%$.
$60.45 \div .31 = 195$, Ans.

172. $20 \times 12 \times 4 = 960$ cu. ft., or $7\frac{1}{2}$ cd.
$7\frac{1}{2} \times \$5 = \$37\frac{1}{2}$; $\$50 - \$37\frac{1}{2} = \$12\frac{1}{2}$.

$$\frac{12\frac{1}{2}}{37\frac{1}{2}} = \frac{\overset{1}{\cancel{25}}}{\underset{3}{\cancel{75}}} \times \frac{\cancel{2}}{\cancel{75}} = \frac{1}{3} \text{ of } 100\% = 33\frac{1}{3}\%, \text{ Ans.}$$

173. 4 ft. $= 48$ in.; 48 in. $- 44$ in. $= 4$ in.
$\frac{4}{48}$ or $\frac{1}{12}$ of $\$30 = \$2.50$, Ans.

174. $4 \times 5 \times 2 = 40$ sessions in 4 weeks.
$120 \div 40 = 3$, absent each session.
$400 - 3 = 397$, present each session.

$$\frac{397}{\underset{4}{\cancel{400}}} \text{ of } \cancel{100}\% = 99\frac{1}{4}\%, \text{ Ans.}$$

175. $\$2.50 \times .20 = \$0.50$; $\$2.50 + \$0.50 = \$3$, sold for.
$\$3 = 75\%$ of marked price; $\$3 \div .75 = \$4$, Ans.

176. $62\frac{3}{5} - 57\frac{1}{2} = 4\frac{7}{10}$ lb.; $\frac{4\frac{7}{10}}{62\frac{3}{5}} = \frac{39}{499}$ of $100\% = 7\frac{4}{499}\%$, Ans.

177. $100\% + 69\% = 169\%$; $503620 = 169\%$.

$$\frac{503620}{169} \times 100 = 298000, \text{ Ans.}$$

Article 259.

12. $1728 = Principal.
.06 = Rate.
$103.68 = 1 year's int.
$3\frac{3}{4}$
31104
7776
$388.80 = Interest.
1728.00 = Principal.
Ans. $2116.80 = Amount.

13. $144 = Principal.
.05 = Rate.
$7.20 = 1 year's int
$1\frac{3}{5}$
720
480
Ans. $12.00 = Interest.

16. $1500 = Principal.
.06 = Rate.
$90.00 = 1 year's interest.
$2\frac{13}{24}$
18000
4875
$228.75 = Interest.
1500.00
Ans. $1728.75 = Amount.

Article 260.

17. $2464 = Principal.
.05 = Rate.
$123.20 = 1 year's int.
$2\frac{9}{24}$
24640
$9753\frac{1}{3}$
Ans. $343.93\frac{1}{3}$ = Interest.

18. $2503.75 = Principal.
.06 = Rate.
$150.2250 = 1 year's int.
$3\frac{107}{120}$
4506750
1339506
Ans. $584.6256 = Interest.

19. $560.50 = Principal.
.07 = Rate.
$39.2350 = 1 year's int.
$4\frac{1}{36}$
1569400
10898
Ans. $158.0298 = Interest.

20. $97.16 = Principal.
.06 = Rate.
$5.8296 = 1 year's int.
$1\frac{4}{12}$
58296
24290
Ans. $8.2586 = Interest.

21. $156.80 = Principal.
.04 = Rate.
$6.2720 = 1 year's int.
$3\frac{11}{120}$
188160
5749
Ans. $19.3909 = Interest.

22. $865 = Principal.
.08 = Rate.
$69.20 = 1 year's int.
$1\frac{48}{60}$
6920
5651
Ans. $125.71 = Interest.

23. $890 = Principal.
.06 = Rate.
$53.40 = 1 year's int.
$5\frac{198}{180}$
26700
3233
Ans. $299.33 = Interest.

24. $5000 = Principal.
.07 = Rate.
$350.00 = 1 year's int.
$3\frac{17}{18}$
105000
33055
$1380.55\frac{5}{9}$ = Interest.
5000.00
Ans. $6380.55\frac{5}{9}$ = Amount.

Article 262.

28.

2) $56.80 = Principal.
.2840 = 1 mo.'s int.
$20\frac{17}{30}$ = Time in mo.
56800
$1609\frac{1}{3}$
Ans. $5.8409\frac{1}{3}$ = Interest.

29.

2) $6000 = Principal.
30.00 = 1 mo.'s int.
50 = Time in mo.
Ans. $1500.00 = Interest.

30.

2) $17.28 = Principal.
.0864 = 1 mo.'s int.
$23\frac{1}{10}$ = Time in mo.
2592
1728
$86\frac{2}{5}$
Ans. 1.9958\frac{2}{5}$ = Interest.

31.

2) $1850.75 = Principal.
9.25375 = 1 mo.'s int.
$9\frac{4}{5}$ = Time in mo.
740300
8328375
Ans. 90.686\frac{3}{4}$ = Interest.

32.

2) $253.50 = Principal.
1.2675 = 1 mo.'s int.
$28\frac{7}{30}$ = Time in mo.
2957½
101400
25350
Ans. 35.7857\frac{1}{2}$ = Int.

33.

2) $85.90 = Principal.
.4295 = 1 mo.'s int.
$42\frac{9}{10}$ = Time in mo.
8590
17180
3865½
Ans. 18.4255\frac{1}{2}$ = Interest.

34.

2) $1992.25 = Principal.
9.96125 = 1 mo.'s int.
$3\frac{1}{10}$ = Time in mo.
2988375
99612½
Ans. 30.87987\frac{1}{2}$ = Interest.

35.

2) $15600 = Principal.
78.00 = 1 mo.'s int.
$55\frac{18}{30}$ = Time in mo.
39000
39000
4940
Ans. $4339.40 = Interest.

36.

2) $1400 = Principal.
$7.00 = 1 mo.'s int.
30 = Time in mo.
$210.00 = Interest.
1400. = Principal.
Ans. $1610.00 = Amount.

37.

2) $7000 = Principal.
35.00 = 1 mo.'s int.
63 = Time in mo.
10500
21000
$2205.00 = Int.
7000. = Principal.
Ans. $9205.00 = Amount.

Article 263.

38.

2) $545 = Principal.
2.725 = 1 mo.'s int.
$8\frac{4}{5}$ = Time in mo.
21800
2180
3) 23.980 = Int. at 6%.
$7.993\frac{1}{3}$ = " 2%.
Ans. 15.986\frac{2}{3}$ = " 4%.

39.

2) $78.50 = Principal.
.3925 = 1 mo.'s int.
$4\frac{1}{10}$ = Time in mo.
15700
$392\frac{1}{2}$
6) $1.6092\frac{1}{2}$ = Int. at 6%.
$.2682\frac{1}{12}$ = " 1%.
Ans. 1.3410\frac{5}{12}$ = " 5%.

40.

2) $64.70 = Principal.
.3235 = 1 mo.'s int.
29 = Time in mo.
29115
6470
6) 9.3815 = Int. at 6%.
$1.5635\frac{5}{6}$ = " 1%.
Ans. 10.9450\frac{5}{6}$ = " 7%.

41.

2) $1440 = Principal.
7.20 = 1 mo.'s int.
$11\frac{33}{50}$ = Time in mo.
720
720
552
4) 84.72 = Int. at 6%.
21.18 = " $1\frac{1}{2}$%.
Ans. $63.54 = " $4\frac{1}{2}$%.

42.

2) $9500 = Principal.
47.50 = 1 mo.'s int.
$42\frac{17}{30}$ = Time in mo.
9500
19000
$2691\frac{2}{3}$
6) $2021.91\frac{2}{3}$ = Int. at 6%.
$336.98\frac{11}{18}$ = " 1%.
Ans. 2358.90\frac{5}{18}$ = " 7%.

43.

2) $600.80 = Principal.
3.0040 = 1 mo.'s int.
$35\frac{1}{10}$ = Time in mo.
150200
90120
3004
3) 105.4404 = Int. at 6%.
35.1468 = " 2%.
Ans. $140.5872 = " 8%.

44.

2) $20000 = Principal.
100.00 = 1 mo.'s int.
$2\frac{1}{10}$ = Time in mo.
20000
1000
6) 210.00 = Int. at 6%.
35.00 = " 1%.
Ans. $175.00 = " 5%.

45.

2) $340.90 = Principal.
1.7045 = 1 mo.'s int.
$55\frac{11}{30}$ = Time in mo.
85225
85225
$6249\frac{4}{6}$
6) 94.3724 = Int. at 6%.
$15.7287\frac{17}{36}$ = " 1%.
Ans. $110.1012 = " 7%.

46.

2) $15420 = Principal.
77.10 = 1 mo.'s int.
$9\frac{4}{5}$ = Time in mo.
69390
6168
12) 755.58 = Int. at 6%.
62.965 = " $\frac{1}{2}$%.
Ans. $818.545 = " $6\frac{1}{2}$%.

47.

2) $374.75 = Principal.
1.87375 = 1 mo.'s int.
45 = Time in mo.
936875
749500
3) 84.31875 = Int. at 6%.
28.10625 = " 2%.
Ans. $112.42500 = " 8%.

48. Time = 1 y. 1 mo. 11 d.

2) $525 = Principal.
2.625 = 1 mo.'s int.
$13\frac{11}{30}$ = Time in mo.
7875
2625
$962\frac{1}{2}$
6) $35.087\frac{1}{2}$ = Int. at 6%.
$5847\frac{11}{12}$ = " 1%.
$40.935\frac{5}{12}$ = " 7%.
525.
Ans. $565.935 = Amount.

49. Time = 1 y. 9 mo. 26 d.

2) $450.60 = Principal.
2.2530 = 1 mo.'s int.
$21\frac{3}{8}$ = Time in mo.
22530
45060
19526
6) 49.2656 = Int. at 6%.
8.2109 = " 1%.
$57.4765 = " 7%.
450.60
Ans. $508.0765 = Amount.

Article 264.

52. Time = 132 d. $66.42 = Principal.
Interest for 60 d. = .6642 = .01 of principal.
" " 60 " = .6642 = .01 " "
" " 12 " = .13284 = $\frac{1}{5}$ of 60 days' interest.
" " 132 d. = $1.46124 at 6%.
" " " = 0.24354 " 1%.
" " " = $1.21770 " 5%, Ans.

53. Time = 93 d. $8000 = Principal.
Interest for 60 d. = 80.00 = .01 of principal.
" " 30 " = 40.00 = $\frac{1}{2}$ of 60 days' interest.
" " 3 " = 4.00 = $\frac{1}{10}$ of 30 days' interest.
" " 93 d. = $124.00 at 6%.
" " " = $20.66\frac{2}{3}$ " 1%.
" " " = $144.66\frac{2}{3}$ " 7%, Ans.

54. Time = 45 d. $130.50 = Principal.
Interest for 60 " = 1.305 = .01 of principal.
" " 30 d. = .6525 = $\frac{1}{2}$ of 60 days' interest.
" " 15 " = .32625 = $\frac{1}{2}$ " 30 " "
" " 45 d. = .97875 at 6%.
" " " = .32625 " 2%.
" " " = $1.30500 " 8%, Ans.

55. Time = 81 d. $7500 = Principal.
Interest for 60 d. = 75.00 = .01 of principal.
" " 20 " = 25.00 = $\frac{1}{3}$ of 60 days' interest.
" " 1 " = 1.25 = $\frac{1}{20}$ of 20 days' interest.
" " 81 d. = $101.25 at 6%, Ans.

56. 1 y. 3 mo. 6 d. = 456 d.

Time =	456 d.	$225	= Principal.
Interest for	60 d. =	2.25	= .01 of principal.
" "	360 " =	13.50	= 6 × 60 days' interest.
" "	30 " =	1.125	= ½ of " " "
" "	6 " =	.225	= ⅕ " 30 " "
" "	456 d. =	$17.100	at 6%, Ans.

57. 3 mo. 15 d. = 105 d.

Time =	105 d.	$163.20	= Principal.
Interest for	60 d. =	$1.632	= .01 of principal.
" "	30 " =	.816	= ½ of 60 days' interest.
" "	15 " =	.408	= ½ " 30 " "
" "	105 d. =	$2.856	at 6%.
" "	" =	.476	" 1%.
" "	" =	$4.760	" 10%.
		163.20	
	Ans.	$167.960,	Amount.

58. 1 y. 1 mo. 23 d. = 413 d.

Time =	413 d.	$900.65	= Principal.
Interest for	60 d. =	9.0065	= .01 of principal.
" "	300 " =	45.0325	= 5 × 60 days' interest.
" "	30 " =	4.5032	= ½ of " " "
" "	20 " =	3.0021	= ⅔ " 30 " "
" "	3 " =	.4503	= $\frac{1}{10}$ " " " "
" "	413 d. =	$61.9946	at 6%.
		900.65	
	Ans.	$962.6446	= Amount.

59. 1 y. 1 mo. 12 d. = 402 d.

Time =	402 d.	$4000	=	Principal.
Interest for	60 d. =	$40.00	=	.01 of principal.
" "	300 " =	200.00	=	5 × 60 days' interest.
" "	40 " =	26.66⅔	=	⅔ of " " "
" "	2 " =	1.33⅓	=	1/30 " 40 " "
" "	402 d. =	$268.00	at	6%.
" "	" =	67.00	"	1½%.
" "	" =	$201.00	"	4½%, Ans.

60. 2 y. 8 mo. 29 d. = 989 d.

Time =	989 d.	$653.63	=	Principal.
Interest for	60 d. =	6.5363	=	.01 of principal.
" "	900 " =	98.0445	=	15 × 60 days' interest
" "	20 " =	2.1787	=	⅓ of " " "
" "	5 " =	.5446	=	¼ " 20 " "
" "	4 " =	.4357	=	⅕ " 20 " "
" "	989 d. =	$107.7398	at	6 %.
" "	" =	17.9566	"	1 %.
" "	" =	$125.6964	"	7 %.
		653.63		
	Ans.	$779.3264		Amount.

61.

Time =	60 d.	$4498.25	=	Principal.
Interest for	60 d. =	$44.9825	=	.01 of principal.
		7.4970	at	1 %.
Interest for	60 d. =	$37.4855	"	5 %.
		4498.25		
	Ans.	$4535.7355	=	Amount.

62. $248 = Principal.
.03½ = Rate.
744
124
$8.68 = 1 year's interest.
0 11/20
Ans. $4.774 = Interest at 3½ %.

63. $845 = Principal.
.04 = Rate.
$33.80 = 1 year's int.
13 7/360
10140
3380
685 7/18
Ans. $446.25 = Int. at 4 %.

64.

2) $245.80 = Principal.
1.2290 = 1 mo.'s int.
29 7/30 = Time in mo.
110610
24580
2867
$35.9277 = Int. at 6 %.
8.9819 = " 1½ %.
Ans. $26.9458 = " 4½ %.

65.

2) $960 = Principal.
4.80 = 1 mo.'s int.
43 3/10 = Time in mo.
1440
1920
144
$207.84 = Int. at 6 %.
34.64 = " 1 %.
Ans. $173.20 = " 5 %.

66.

2) $849.50 = Principal.
4.2475 = 1 mo.'s int.
100⅔ = Time in mo.
4247500
16990
Ans. $426.4490 = Int. at 6 %.

67.

2) $2846 = Principal.
14.23 = 1 mo.'s int.
41⅓ = Time in mo.
1423
5692
4743
$588.173 = Int. at 6 %.
49.014 = " ½ %.
Ans. $637.187 = " 6½ %

68.

2) $180 = Principal.
.90 = 1 mo.'s int.
$21\frac{1}{2}$ = Time in mo.
90
180
45
$19.35 = Int. at 6 %.
3.225 = " 1 %.
Ans. $22.575 = " 7 %.

69.

2) $948.39 = Principal.
4.74195 = 1 mo.'s int.
$47\frac{1}{2}$ = Time in mo.
3319365
1896780
94839
$223.82004 = Int. at 6 %.
55.95501 = " $1\frac{1}{2}$ %.
Ans. $279.77505 = " $7\frac{1}{2}$ %.

70.

2) $862 = Principal.
4.31 = 1 mo.'s int.
$55\frac{11}{15}$ = Time in mo.
2155
2155
316
$240.21 = Int. at 6 %.
80.07 = " 2 %.
Ans. $320.28 = " 8 %.

71.

2) $1500 = Principal.
7.50 = 1 mo.'s int.
$15\frac{9}{10}$ = Time in mo.
3750
750
675
$119.25 = Int. at 6 %.
59.625 = " 3 %.
Ans. 178.87\frac{1}{2}$ = " 9 %.

72.

2) $8400 = Principal.
42.00 = 1 mo.'s int.
$2\frac{17}{30}$ = Time in mo.
8400
2380
$107.80 = Int. at 6 %.
23.35$\frac{2}{3}$ = " 1.3 %.
Ans. 131.15\frac{2}{3}$ = " 7.3 %.

73.

2) $9398 = Principal.
46.99 = 1 mo.'s int.
$1\frac{3}{4}$ = Time in mo.
4699
28194
$75.184 = Int. at 6 %.
50.122 = " 4 %.
Ans. $125.306 = " 10 %.

74.

2) $479.85 = Principal.
2.39925 = 1 mo.'s int.
$3\frac{8}{15}$ = Time in mo.
719775
127960
$8.47735 = Int. at 6%.
1.41289 = " 1%.
Ans. $7.06446 = " 5%.

75.

2) $948.25 = Principal.
4.74125 = 1 mo.'s int.
$2\frac{28}{30}$ = Time in mo.
948250
458320
$14.06570 = Int. at 6%.
3.51642 = " $1\frac{1}{2}$%.
Ans. $10.54928 = " $4\frac{1}{2}$%.

76.

2) $84.32 = Principal.
.4216 = 1 mo.'s int.
$1\frac{1}{2}$ = Time in mo.
4216
2108
$0.6324 = Int. at 6%.
0.2108 = " 2%.
Ans. $0.4216 = " 4%.

77.

2) $961.18 = Principal.
4.8059 = 1 mo.'s int.
$3\frac{7}{10}$ = Time in mo.
144177
33641
Ans. $17.7818 = Int. at 6%.

78.

Time = 4 mo. 21 d.
2) $549.82 = Principal.
2.7491 = 1 mo.'s int.
$4\frac{7}{10}$ = Time in mo.
109964
19243
$12.9207 = Int. at 6%.
6.4603 = " 3%.
$19.3810 = " 9%.
549.82
Ans. $569.2010 = Amount.

79.

Time = 7 mo. 18 d.
2) $856.84 = Principal.
4.2842 = 1 mo.'s. int.
$7\frac{3}{5}$ = Time in mo
299894
25705
$32.5599 = Int. at 6%.
10.8533 = " 2%.
$43.4132 = " 8%.
856.84
Ans. $900.2532 = Amount.

80.

Time = 2 mo. 7 d.

2) $1248 = Principal.
6.24 = 1 mo.'s int.
$2\frac{7}{30}$ = Time in mo.
1248
1456
$13.936 = Int. at 6 %.
1248.
Ans. $1261.936 = Amount.

81.

Time = 1 y. 6 mo. 4 d.

2) $960.50 = Principal.
4.8025 = 1 mo.'s int.
$18\frac{2}{15}$ = Time in mo.
384200
48025
$6403\frac{1}{3}$
$87.0853 = Int. at 6 %.
21.7713 = " $1\frac{1}{2}$ %.
$65.3140 = " $4\frac{1}{2}$ %.
960.50
Ans. $1025.8140 = Amount.

82.

Time = 3 mo. 6 d.

2) $849.25 = Principal.
4.24625 = 1 mo.'s int.
$3\frac{1}{3}$ = Time in mo.
1273875
84925
$13.58800 = Int. at 6%.
$2.26466\frac{2}{3}$ = " 1%.
$11.32333\frac{1}{3}$ = " 5%.
849.25
Ans. 860.57333\frac{1}{3}$ = Amount.

83.

Time = 2 y. 4 mo. 14 d.

2) $562.75 = Principal.
2.81375 = 1 mo.'s int.
$28\frac{7}{15}$ = Time in mo.
2251000
562750
131308
$80.09808 = Int. at 6 %.
13.34968 = " 1 %.
$93.44776 = " 7 %.
562.75
Ans. $656.19776 = Amount.

84.

Time = 7 mo. 5 d.

2) $476.84 = Principal.
2.3842 = 1 mo.'s int.
$7\frac{1}{8}$ = Time in mo.
166894
3973
$17.0867 = Int. at 6 %.
4.2716 = " $1\frac{1}{2}$ %.
$21.3583 = " $7\frac{1}{2}$ %.
476.84
Ans. $498.1983 = Amount.

85.

Time = 3 mo. 29 d.

2) $942 = Principal.
4.71 = 1 mo.'s int.
$3\frac{29}{30}$ = Time in mo.
1413
4553
$18.683 = Int. at 6 %.
7.784 = " $2\frac{1}{2}$ %.
$10.899 = " $3\frac{1}{2}$ %.
942.00
Ans. $952.899 = Amount.

86.

Time = 1 y. 8 mo. 25 d.

2) $1728 = Principal.
8.64 = 1 mo.'s int.
$20\frac{5}{6}$ = Time in mo.
17280
720
$180.00 = Int. at 6 %.
60.00 = " 2 %.
$240.00 = " 8 %.
1728.00
Ans. $1968.00 = Amount.

87.

Time = 3 mo. 6 d.

2) $945.96 = Principal.
4.7298 = 1 mo.'s int.
$3\frac{1}{5}$ = Time in mo.
141894
94596
$15.13536 = Int. at 6 %.
7.56768 = " 3 %.
$22.70304 = " 9 %.
945.96
Ans. $968.66304 = Amount.

88.

Time = 2 mo. 27 d.

2) $200 = Principal.
1.00 = 1 mo.'s int.
$2\frac{9}{10}$ = Time in mo.
200
90
$2.900 = Int. at 6 %.
0.4833⅓ = " 1 %.
$4.833⅓ = " 10 %.
200.00
Ans. $204.833⅓ = Amount.

89.

Time = 1 y. 5 mo. 27 d.

2) $816.42 = Principal.
4.0821 = 1 mo.'s int.
$17\frac{9}{10}$ = Time in mo.
285747
40821
36738
$73.0695 = Int. at 6 %.
12.1782 = " 1 %.
$85.2477 = " 7 %.
816.42
Ans. $901.6677 = Amount.

90.

Time = 4 y. 5 mo.

2) $945.55 = Principal.
4.72775 = 1 mo.'s int.
53 = Time in mo.
1418325
2363875
$250.57075 = Int. at 6 %.
41.76179 = " 1 %.
$292.33254 = " 7 %.
945.55
Ans. $1237.88254 = Am't.

91.

Time = 3 mo. 11 d.

2) $624.87 = Principal.
3.12435 = 1 mo.'s int.
$3\frac{11}{30}$ = Time in mo.
937305
114559
$10.51864 = Int. at 6 %.
1.75310 = " 1 %.
$8.76554 = " 5 %.
624.87
Ans. $633.63554 = Amount.

Article 265.

93. Time = 111 days. $3000 × .05 = $150.

$$\frac{\$\,\overset{30}{\cancel{150}} \times 111}{\underset{73}{\cancel{365}}} = \$45.62, \text{ Ans.}$$

94. Time = 134 days. $\$1000 \times .04\frac{1}{2} = \$45.$

$$\frac{\$\overset{9}{\cancel{45}} \times 134}{\overset{365}{\cancel{365}}} = \$16.52, \text{ Ans.}$$
$$73$$

95. Time = 303 days. $\$225.50 \times .06 = \$13.53.$

$\frac{\$13.53 \times 303}{365} = \$11.23$; $\$225.50 + \$11.23 = \$236.73$, Ans.

97.

$\$250 \times .01 \times 1\frac{1}{2} = \$3.125$; $\$28.12\frac{1}{2} \div \$3.125 = 9\%$, Ans.

Article 266.

98. $\$1400 \times .01 \times 1\frac{1}{2} = \$21$; $\$126 \div \$21 = 6\%$, Ans.

99. $\$1000 \times .01 \times 4\frac{7}{10} = \$47$; $\$282 \div \$47 = 6\%$, Ans.

100. $\$416 \times .01 \times 3\frac{8}{45} = \$12.66\frac{23}{45}$;

$\$88.64 \div \$12.66\frac{23}{45} = 6\frac{1778}{1781}\%$, Ans.

101.

$\$1600 \times .01 \times \frac{11}{60} = \$2.93\frac{1}{3}$; $\$46.20 \div \$2.93\frac{1}{3} = 15\frac{3}{4}\%$, Ans.

102. $\$250.58 - \$241.20 = \$9.38.$

$\$241.20 \times .01 \times \frac{5}{9} = \$1.34$; $\$9.38 \div \$1.34 = 7\%$, Ans.

103.

$\$480 \times .01 \times 2\frac{5}{12} = \$11.60$; $\$52.20 \div \$11.60 = 4\frac{1}{2}\%$, Ans.

104. Time = 2 mo. 0 d.

$\$640 \times .01 \times \frac{11}{60} = \$1.17\frac{1}{3}$; $\$10.56 \div \$1.17\frac{1}{3} = 9\%$, Ans.

105. $\$1084 - \$960 = \$124$, interest.

$\$960 \times .01 \times 1\frac{7}{24} = \$12.40$; $\$124 \div \$12.40 = 10\%$, Ans.

106. $\$444 \times .01 \times 6\frac{5}{12} = \$28.49$; $\$156.695 \div \$28.49 = 5\frac{1}{2}\%$, Ans.

107. $\$500 \times 2 = \$1000$, interest; $\$25000 \times .01 \times 1 = \$250$.

$\$1000 \div \$250 = 4\%$, Ans.

109. $\$140 \times .07 = \$9.80$; $\$49.00 \div \$9.80 = 5$ years, Ans.

Article 267.

110. $\$98 \times .08 = \$7.84$; $\$23.48 \div \$7.84 = 2\frac{184}{196}$.

$2\frac{184}{196}$ y. $= 2$ y. 11 mo. $28\frac{8}{49}$ d., Ans.

111. $\$75 \times .06 = \$4.50$; $\$6.25 \div \$4.50 = 1\frac{7}{18}$.

$1\frac{7}{18}$ y. $= 1$ y. 4 mo. 20 d., Ans.

112. $\$3600 \times .07 = \$252$; $\$46.20 \div \$252 = \frac{11}{60}$.

$\frac{11}{60}$ y. $= 2$ mo. 6 d., Ans.

113. $\$875 \times .06 = \$52.50$; $\$7.00 \div \$52.50 = \frac{2}{15}$.

$\frac{2}{15}$ y. $= 1$ mo. 18 d., or 48 d., Ans.

114. $\$9080 \times .03\frac{1}{3} = \$317.80$; $\$794.50 \div \$317.80 = 2\frac{1}{2}$

$2\frac{1}{2}$ y. $= 2$ y. 6 mo., Ans.

115. $\$750 \times .06 = \$45$; $\$750 \div \$45 = 16\frac{2}{3}$.

$16\frac{2}{3}$ y. $= 16$ y. 8 mo., Ans.

116. $\$540 \times .04 = \$21.60$; $\$700 - \$540 = \$160$, interest.
$\$160 \div \$21.60 = 7\frac{1}{27}$; $7\frac{1}{27}$ y. = 7 y. 4 mo. $26\frac{2}{3}$ d., Ans.

117. $\$892 \times .10 = \$89.20$; $\$187 \div \$89.20 = 2\frac{43}{446}$.
$2\frac{43}{446}$ y. = 2 y. 1 mo. $4\frac{158}{223}$ d., Ans.

118. $\$12000 \times .04\frac{1}{2} = \$540$; $\$2500 \div \$540 = 4\frac{17}{27}$.
$4\frac{17}{27}$ y. = 4 y. 7 mo. $16\frac{2}{3}$ d., Ans.

119. $\$6000 - \$4500 = \$1500$; $\$4500 \times .03\frac{1}{3} = \$157.50$.
$\$1500 \div \$157.50 = 9\frac{11}{21}$; $9\frac{11}{21}$ y. = 9 y. 6 mo. $8\frac{4}{7}$ d., Ans.

122. $\$1 \times .06 \times 1\frac{7}{18} = \$0.08\frac{1}{3}$; $\$6.25 \div \$0.08\frac{1}{3} = \$75$, Ans.

Article 268.

123.

$\$1 \times .07 \times \frac{11}{60} = \$0.012\frac{5}{6}$; $\$46.20 \div \$0.012\frac{5}{6} = \$3600$, Ans.

124. $\$1 \times .04 \times 1\frac{1}{2} = \$0.06$; $\$1 + \$0.06 = \$1.06$.
$\$318 \div \$1.06 = \$300$, Ans.

125. $\$1 \times .05 \times \frac{4}{9} = \$0.02\frac{2}{9}$; $\$1 + \$0.02\frac{2}{9} = \$1.02\frac{2}{9}$.
$\$734.20 \div \$1.02\frac{2}{9} = \$718.23\frac{21}{23}$, Ans.

126. $\$1 \times .06 = \$0.06$; $\$210 \times 4 = \$840$, annual income.
$\$840 \div \$0.06 = \$14000$, Ans.

127. $\$1 \times .05 = \$0.05$; $\$1200 \div \$0.05 = \$24000$, Ans.

128.

$\$1 \times .07 \times 2\frac{1}{2} = \$0.175$; $\$118.23 \div \$0.175 = \$675.60$, Ans.

129. $3\frac{1}{4}\% \times 2 = 6\frac{1}{2}\%$ annually; $\$1 \times .06\frac{1}{2} = \$0.065$.

$\$924 \div \$0.065 = \$14215.38\frac{6}{13}$, Ans.

130. $\$1 \times .04 = \$0.04$; $\$560 \div \$0.04 = \$14000$, Ans.

131. $\$1 \times .09 = \$0.09$; $\$324 \times 4 = \$1296$, income.

$\$1296 \div \$0.09 = \$14400$, Ans.

132. $\$5400 \times 365 = \$1971000$, annual income.

$\$1971000 \div 2 = \$985500$.

$\$985500 \div .08 = \$12318750$, invested in railroad stock.

$\$985500 \div .04 = \$24637500$, " " gov't securities.

$\$12318750 + \$24637500 = \$36956250$, Ans.

Article 282.

134.

Principal	$600.00
Int. from Jan. 6, 1896, to Apr. 6, 1896, 3 mo.	10.50
Amount	$610.50
1st payment	50.00
New principal	$560.50
Int. from Apr. 6, 1896, to Nov. 21, 1896, 7 mo. 15 d.	24.52
Amount	$585.02
2d payment	60.50
New principal	$524.52
Int. from Nov. 21, 1896, to Mar. 31, 1897, 4 mo. 10 d.	13.26
Amount	$537.78
3d payment	150.00
New principal	$387.78
Int. from Mar. 31, 1897, to June 30, 1897, 3 mo.	6.79
Amount due June 30, 1897, Ans.	$394.57

135.

Principal	$750.00
Int. from Oct. 12, 1896, to Dec. 27, 1896, 2 mo. 15 d.	9.38
Amount	$759.38
1st payment	325.00
New principal	$434.38
Int. from Dec. 27, 1896, to Aug. 7, 1897, 7 mo. 11 d.	16.00
Amount	$450.38
2d payment	25.00
New principal	$425.38
Int. from Aug. 7, 1897, to July 1, 1898, 10 mo. 24 d.	22.97
Amount due July 1, 1898 Ans.	$448.35

136.

Principal	$1500.00
Int. from Mar. 10, 1896, to Nov. 25, 1896, 8 m. 15 d.	53.13
Int. from Nov. 25, 1896, to July 20, 1897, 7 m. 25 d.	48.96
Amount	$1602.09
1st payment less than interest due $45	
2d payment 500	545.00
New principal	$1057.09
Int. from July 20, 1897, to Jan. 30, 1898, 6 m. 10 d.	27.90
Amount	$1084.99
3d payment	600.00
New principal	$484.99
Int. from Jan. 30, 1898, to May 15, 1898, 3 m. 15 d.	7.07
Amount due May 15, 1898 Ans.	$492.06

137.

Principal	$563.50
Int. from May 16, 1895, to Sept. 26, 1895, 4 m. 10 d.	14.24
Amount	$577.74
1st payment	250.00
New principal	$327.74
Int. from Sept. 26, 1895, to May 16, 1896, 7 m. 20 d.	14.66
Amount due May 16, 1896 Ans.	$342.40

138.

$3000. *Boston, Feb. 9, 1896.*

For value received I promise to pay CHARLES E. LOWE, or order, three thousand dollars, on demand, with interest at 5 per cent.

Indorsements: Mar. 9, 1897, $1000; Nov. 24, 1897, $800.

Principal	$3000.00
Int. from Feb. 9, 1896, to March 9, 1897, 1 y. 1 m.	162.50
Amount	$3162.50
1st payment	1000.00
New principal	$2162.50
Int. from Mar. 9, 1897, to Nov. 24, 1897, 8 m. 15 d.	76.59
Amount	$2239.09
2d payment	800.00
New principal	$1439.09
Int. from Nov. 24, 1897, to Jan. 3, 1898, 1 mo. 10 d.	7.99
Amount due Jan. 3, 1898 . . . . . Ans.	$1447.08

139.

Principal	$1200.00
Int. from Aug. 7, 1896, to May 13, 1897, 9 m. 6 d.	36.80
Amount	$1236.80
1st payment	300.00
New principal	$936.80
Int. from May 13, 1897, to Nov. 23, 1898, 1 y. 6 m. 10 d.	57.25
Amount	$994.05
2d payment	275.00
New principal	$719.05
Int. from Nov. 23, 1898, to Jan. 1, 1899, 1 m. 9 d.	3.12
Amount due Jan. 1, 1899 . . . . . Ans.	$722.17

140.

Principal		$ 6000.00
Int. from Jan. 1, 1889, to Aug. 11, 1889, 7 m. 10 d.		275.00
Amount		$ 6275.00
1st payment		400.00
New principal		$ 5875.00
Int. from Aug. 11, 1889, to Dec. 15, 1890, 1 y. 4 m. 4 d.		592.40
Amount		$ 6467.40
2d payment		700.00
New principal		$ 5767.40
Int. from Dec. 15, 1890, to May 15, 1891, 5 m.		180.23
Amount due May 15, 1891	Ans.	$ 5947.63

141.

Principal		$ 500.00
Int. from Jan. 1, 1895, to Jan. 1, 1896, 1 y.		50.00
Amount		$ 550.00
1st payment		100.00
New principal		$ 450.00
Int. from Jan. 1, 1896, to Jan. 1, 1897, 1 y.		45.00
Amount		$ 495.00
2d payment		100.00
New principal		$ 395.00
Int. from Jan. 1, 1897, to June 19, 1897, 5 m. 18 d.		18.43
Amount due June 19, 1897	Ans.	$ 413.43

142.

Principal			$ 2400.00
Int. from Aug. 12, 1896, to Sept. 12, 1897, 1 y. 1 m.			117.00
" " Sept. 12, 1897, to Oct. 12, 1897, 1 m.			9.00
Amount			$ 2526.00
1st payment less than int. due		$ 25	
2d payment		700	725.00
New principal			$ 1801.00
Int. from Oct. 12, 1897, to Feb. 15, 1898, 4 m. 3 d.			27.69
Amount due Feb. 15, 1898	Ans.		$ 1828.69

143.

Principal	$1728.00
Int. from Nov. 23, 1894, to May 15, 1895, 5 m. 22 d.	74.30
Amount	$1802.30
1st payment	248.00
New principal	$1554.30
Int. from May 15, 1895, to Aug. 28, 1896, 1y. 3m. 13d.	179.91
Amount	$1734.21
2d payment	301.00
New principal	$1433.21
Int. from Aug. 28, 1896, to May 30, 1897, 9 m. 2 d.	97.46
Amount	$1530.67
3d payment	300.00
New principal	$1230.67
Int. from May 30, 1897, to Nov. 10, 1897, 5 m. 11 d.	49.53
Amount due Nov. 10, 1897, ... Ans.	$1280.20

Article 283.

145.

Amount of	$1164.50	for 1 y.		$1246.02
"	$250.00	" 9 mo. 15 d. . .	$263.85	
"	$315.00	" 7 mo. 14 d. . .	328.72	
"	$100.00	" 4 mo.	102.33	
"	$200 00	" 1 mo. 19 d. . .	201.91	896.81
			Ans.	$349.21

Article 285.

151.

Principal for 1st year	$750.00
Interest " "	37.50
Principal for 2d year	$787.50
Interest " "	39.38
Principal for 3d year	$826.88
Interest " "	41.34
Principal for 4th year	$868.22
Interest " "	43.41
Compound amount for 4 years	$911.63
Given principal	750.00
Compound interest for 4 years . . Ans.	$161.63

Article 286.

152.

Principal for 1st year	$600.00
Interest " "	30.00
Principal for 2d year	$630.00
Interest " "	31.50
Principal for 3d year	$661.50
Interest " "	33.08
Principal for 6 mo.	$694.58
Interest " "	17.36
Compound amount for 3 y. 6 mo.	$711.94
Given principal	600.00
Compound interest for 3 y. 6 mo. . Ans.	$111.94

153.

Principal for 1st year	$320.00
Interest " "	22.40
Principal for 2d year	$342.40
Interest " "	23.97
Principal for 9 mo.	$366.37
Interest " "	19.23
Compound amount for 2 y. 9 mo.	$385.60
Given principal	320.00
Compound interest for 2 y. 9 mo. . . Ans.	$65.60

154.

Principal for 1st year	$500.00
Interest " "	20.00
Principal for 2d year	$520.00
Interest " "	20.80
Principal for 3d year	$540.80
Interest " "	21.63
Principal for 4th year	$562.43
Interest " "	22.50
Principal for 4 mo. 15 d.	$584.93
Interest " "	8.77
Compound amount for 4 y. 4 mo. 15 d. .	$593.70
Given principal	500.00
Compound interest for 4 y. 4 mo. 15 d. Ans.	$93.70

155.

Principal for 1st 6 mo.	$1000.00
Interest " "	30.00
Principal for 2d 6 mo.	$1030.00
Interest " "	30.90
Principal for 3d 6 mo.	$1060.90
Interest " "	31.83
Principal for 4th 6 mo.	$1092.73
Interest " "	32.78
Compound amount for 2 years . . Ans.	$1125.51

156. Principal for 1st 3 mo. $1200.00
Interest " " 12.00
Principal for 2d 3 mo. $1212.00
Interest " " 12.12
Principal for 3d 3 mo. $1224.12
Interest " " 12.24
Principal for 4th 3 mo. $1236.36
Interest " " 12.36
Principal for 5th 3 mo. $1248.72
Interest " " 12.49
Principal for 6th 3 mo. $1261.21
Interest " " 12.61
Compound amount for 1 y. 6 mo. . Ans. $1273.82

157. Principal for 1st 6 mo. $200.00
Interest " " 4.00
Principal for 2d 6 mo. $204.00
Interest " " 4.08
Principal for 3d 6 mo. $208.08
Interest " " 4.16
Compound amount for 1 y. 6 mo. . Ans. $212.24

158. Simple int. of $2000 for 1 y. 8 mo. 24 d.= $208.00
Principal 2000.00
Amount of $2000 for 1 y. 8 mo. 24 d. . $2208.00

Principal for 1 year $2000.00
Interest " " 140.00
Principal for 8 mo. 24 d. $2140.00
Interest " " 109.85
Compound amount for 1 y. 8 mo. 24 d. . $2249.85

$2249.85 − $2208 = $41.85, gain, Ans.

159.

Principal for 1st 6 mo.	$300.00
Interest " "	12.00
Principal for 2d 6 mo.	$312.00
Interest " "	12.48
Principal for 3d 6 mo.	$324.48
Interest " "	12.98
Principal for 4th 6 mo.	$337.46
Interest " "	13.50
Principal for 5th 6 mo.	$350.96
Interest " "	14.04
Principal for 6th 6 mo.	$365.00
Interest " "	14.60
Principal for 7th 6 mo.	$379.60
Interest " "	15.18
Principal for 8th 6 mo.	$394.78
Interest " "	15.79
Principal for 9th 6 mo.	$410.57
Interest " "	16.42
Principal for 2 mo. 12 d.	$426.99
Interest " "	6.83
Compound amount for 4 y. 8 mo. 12 d.	$433.82
Given principal	300.00
Compound int. for 4 y. 8 mo. 12 d. Ans.	$133.82

Article 287.

161. Amount of $1 for 20 y. at 7%, from Table = $3.869684.
Amount of $500 for 20 y. at 7% = $3.869684 × 500 = $1934.84, Ans.

162. Amount of $1 for 14 y. at 8%, from table = $2.937194.

Amount of $120 for 14 y. at 8% = $2.937194 × 120 =	$352.46
Given principal	120.00
Compound interest of $120 for 14 y. at 8% Ans.	$232.46

Article 291.

7. $\$1 \times .07 \times 4 = \$0.28$; $\$1 + \$0.28 = \$1.28$.
$\$192 \div \$1.28 = \$150$; $\$192 - \$150 = \$42$, Ans.

Article 292.

8. $\$1 \times .07 \times 1\frac{1}{2} = \$0.105$; $\$1 + \$0.105 = \$1.105$.
$\$3450 \div \$1.105 = \$3122.17$, Ans.

9. $\$1 \times .06 \times 3\frac{1}{3} = \$0.20$; $\$1 + \$0.20 = \$1.20$.
$\$172.86 \div \$1.20 = \$144.05$; $\$172.86 - \$144.05 =$ $\$28.81$, Ans.

10. $\$1 \times .04 \times \frac{1}{4} = \$0.01$; $\$1 + \$0.01 = \$1.01$.
$\$360 \div \$1.01 = \$356.44$, Ans.

11. $\$1 \times .07 \times 2\frac{1}{2} = \$0.175$; $\$5000 \times .175 = \$875$, int.
$\$1 + \$0.175 = \$1.175$; $\$5000 \div \$1.175 = \$4255.32$.
$\$5000 - \$4255.32 = \$744.68$, discount.
$\$875 - \$744.68 = \$130.32$, Ans.

12. $\$1 \times .06 \times 2\frac{5}{8} = \$0.1575$; $\$1 + \$0.1575 = \$1.1575$.
$\$347.25 \div \$1.1575 = \$300$, Ans.

Article 294.

13. $\$125 \times .05 = \$6.25$, Ans.

14. $\$350 \times .06 = \$21$; $\$350 - \$21 = \$329$, Ans.

15. $\$1344.50 \times .02 = \$26.89$, Ans.

16. $\$460.50 \times .10 = \$46.05$; $\$460.50 - \$46.05 = \$414.45$.
$\$414.45 \times .05 = \$20.72$; $\$414.45 - \$20.72 =$ $\$393.73$, Ans.

17. $100\% - 6\% = 94\%$; $\$433 = 94\%$.

$$\frac{\$433}{94} \times 100 = \$460.64, \text{ Ans.}$$

18. $\$1600 \times .25 = \$400$; $\$1600 - \$400 = \$1200$.
$\$1200 \times .05 = \$60$; $\$1200 - \$60 = \$1140$.
$\$1600 \times .70 = \$1120$; $\$1140 - \$1120 = \$20$, Ans.

19.

Boston, Oct. 19, 1896.

TAYLOR & AMES,

Bought of LEACH, SHEWELL, & SANBORN.

200 Greenleaf's Algebra @ 95¢, 10% off	$171	00
50 First Lessons in Numbers @ 18½¢, 7½% off.	8	56
3 Cases School Slates @ $6.35, 20% off.....	15	24
25 Webster's School Dictionary @ $1.12, 12½% off	24	50
	$219	30

$\$219.30 \times .02\frac{1}{2} = \$5.48$; $\$219.30 - \$5.48 = \$213.82$, Ans.

20.

62 yd. Brussels carpeting @ $1.87½	$116	25
118½ " 3-ply carpet @ 90¢	106	65
1 set parlor furniture	285	
1 " black walnut chamber furniture.....	125	
1 " " " " "	140	
	$772	90

$\$772.90 \times .05 = \$38.65$; $\$772.90 - \$38.65 = \$734.25$, Ans.

Article 300.

23. Term of discount, 123 days ...Face of note, $875.00

Interest for	60	"	$8.75	
" "	60	"	8.75	
" "	3	"	.437	
		Bank discount,	$17.94	} Ans.
		Proceeds,	$857.06	

24.

Term of discount,	183 days	.....	Face of note,	$ 85.60
Interest for	60 "	.....		.856
" "	120 "	.....		1.712
" "	3 "	.....		.042
" at 6 %		.....		$ 2.610
" " 1 %		.....		.435
" " 7 %		.....	Bank discount,	$ 3.05 } Ans.
			Proceeds,	$ 82.55 }

25. 93 d. after Jan. 4, 1881, = Apr. 7, 1881, day of maturity.
From Feb. 3, 1881, to Apr. 7, 1881, = 63 d., term of discount.
Interest of $ 600 for 63 d. at 6 % = $ 6.30, bank discount.

$ 600 — $ 6.30 = $ 593.70, proceeds, Ans.

26. 4 mo. 3 d. = 123 d., day of maturity.
123 d. — 15 d. = 108 d., term of discount.
Interest of $ 5000 for 108 d. at 8 % = $ 120, bank discount.

$ 5000 — $ 120 = $ 4880, proceeds, Ans.

27. Interest of $ 10500 for 6 mo. 3 d. at 6 % = $ 320.25.
$ 10500 + $ 320.25 = $ 10820.25, amount due at maturity.
6 mo. 3 d. = 183 d., time of maturity.
183 d. — 60 d. = 123 d., term of discount.
Int. of $ 10820.25 for 123 d. at 5 % = $ 184.85, bank discount.

$ 10820.25 — $ 184.85 = $ 10635.40, proceeds, Ans.

28. 4 mo. 3 d. after Jan. 14 = May 17, day of maturity.
From Feb. 27 to May 17 = 79 d., term of discount.
Interest of $ 485.96 for 79 d. at 6 % = $ 6.40, bank discount.

$ 485.96 — $ 6.40 = $ 479.56, proceeds, Ans.

29. 3 mo. 3 d. after Feb. 12 = May 15, day of maturity.
From Mar. 8 to May 15 = 68 d., term of discount.
Interest of $966 for 68 d. at 7% = $12.77, bank discount.

$966 − $12.77 = $953.23, proceeds, Ans.

30. 2 mo. 3 d. after Apr. 1 = June 4, day of maturity.
From Apr. 15 to June 4 = 50 d., term of discount.
Interest of $1024 for 50 d. at 7½% = $10.67, bank discount.

$1024 − $10.67 = $1013.33, proceeds, Ans.

31. 63 d. after May 5 = July 7, day of maturity.
From May 27 to July 7 = 41 d., term of discount.
Interest of $287 for 41 d. at 8% = $2.61, bank discount.

$287 − $2.61 = $284.39, proceeds, Ans.

32. 93 d. after July 10 = Oct. 11, day of maturity.
93 d. = term of discount.
Interest of $648.50 for 93 d. at 5% = $8.38, bank discount.

$648.50 − $8.38 = $640.12, proceeds, Ans.

33. 5 mo. 3 d. after June 15 = Nov. 18, day of maturity.
From Aug. 4 to Nov. 18 = 106 d., term of discount.
Interest of $984 for 106 d. at 9% = $26.07, bank discount.

$984 − $26.07 = $957.93, proceeds, Ans.

34. 6 mo. 3 d. after Sept. 20 = Mar. 23, day of maturity.
From Nov. 27 to Mar. 23 = 116 d., term of discount.
Interest of $328 for 116 d. at 4% = $4.23, bank discount.

$328 − $4.23 = $323.77, proceeds, Ans.

35. 33 d. after Aug. 25 = Sept. 27, day of maturity.
From Sept. 1 to Sept. 27 = 26 d., term of discount.
Int. of $696 for 26 d. at 4½% = $2.26, bank discount.

$696 − $2.26 = $693.74, proceeds, Ans.

36. 1 mo. 3 d. after Oct. 31 = Dec. 3, day of maturity.
From Nov. 1 to Dec. 3 = 32 d., term of discount.
Int. of $842.50 for 32 d. at $3\frac{1}{2}\%$ = $2.62, bank discount.

$842.50 — $2.62 = $839.88, proceeds, Ans.

37. 3 mo. 3 d. after Sept. 7 = Dec. 10, day of maturity.
From Oct. 10 to Dec. 10 = 61 d., term of discount.
Int. of $500 for 61 d. at 6 % = $5.08, bank discount.

$500 — $5.08 = $494.92, proceeds, Ans.

38. 78 d. after Nov. 12 = Jan. 29, day of maturity.
From Dec. 15 to Jan. 29 = 45 d., term of discount.
Int. of $8643 for 45 d. at 7 % = $75.63, bank discount.

$8643 — $75.63 = $8567.37, proceeds, Ans.

39. 4 mo. 3 d. after Jan. 17 = May 20, day of maturity.
From Feb. 10 to May 20 = 99 d., term of discount.
Int. of $242.16 for 99 d. at 10 % = $6.66, bank discount

$242.16 — $6.66 = $235.50, proceeds, Ans.

40. 93 d. after Dec. 27 = Mar. 30, day of maturity.
From Jan. 15 to Mar. 30 = 74 d., term of discount.
Int. of $800 for 74 d. at 3% = $4.93, bank discount.

$800 — $4.93 = $795.07, proceeds, Ans.

41. 3 mo. 3 d. after Mar. 5 = June 8, day of maturity.
From May 1 to June 8 = 38 d., term of discount.
Int. of $560 for 38 d. at 8% = $4.73, bank discount.

$560 — $4.73 = $555.27, proceeds, Ans.

42. 6 mo. 3 d. after Dec. 11 = June 14, day of maturity.
From March 18 to June 14 = 88 d., term of discount.
Int. of $576 for 88 d. at 5 % = $7.04, bank discount.

$576 — $7.04 = $568.96, proceeds, Ans.

43. 4 mo. 3 d. after Aug. 8 = Dec. 11, day of maturity.
From Oct. 27 to Dec. 11 = 45 d., term of discount.
Int. of $898.96 for 45 d. at 9% = $10.11, bank discount.

$898.96 − $10.11 = $888.85, proceeds, Ans.

45. Bank discount of a $1 note for 63 days = $0.01225.
Proceeds of a $1 note = $1 − $0.01225 = $0.98775.

$1500 ÷ $0.98775 = $1518.60+, Ans.

46. Bank discount of a $1 note for 4 mo. 3 d. = $0.0205.
Proceeds of a $1 note = $1 − $0.0205 = $0.9795.

$293.85 ÷ $0.9795 = $300, face of note, Ans.

Article 301.

47. Bank discount of a $1 note for 63 d. = $0.01225.
Proceeds of a $1 note = $1 − $0.01225 = $0.98775.

$444.48¾ ÷ $0.98775 = $450, face of note, Ans.

48. Bank discount of a $1 note for 6 mo. at 10% = $0.05.
Proceeds of a $1 note = $1 − $0.05 = $0.95.

$1520 ÷ $0.95 = $1600, face of note, Ans.

49. Bank discount of a $1 note for 93 d. = $0.0155.
Proceeds of a $1 note = $1 − $0.0155 = $0.9845.

$828.95 ÷ $0.9845 = $842.00+, face of note, Ans.

50. Bank discount of a $1 note for 8 m. 3 d. at 7½% = $0.050625
Proceeds of a $1 note = $1 − $0.050625 = $0.949375.

$483.56 ÷ $0.949375 = $509.34, face of note, Ans.

MISCELLANEOUS EXERCISES.

51. From Oct. 6, 1881, to Apr. 18, 1882, = 6 mo. 12 d. = $\frac{6}{15}$ y.
$\$1 \times .05 \times \frac{6}{15} = \$0.026\frac{2}{3}$; $\$1 + \$0.026\frac{2}{3} = \$1.026\frac{2}{3}$.
$\$924 \div \$1.026\frac{2}{3} = \$900$, present worth.

$\$924 - \$900 = \$24$, discount, Ans.

52. $\$1 \times .08 = \$0.08$; $\$1 + \$0.08 = \$1.08$.
$\$540 \div \$1.08 = \$500$, present worth.

$\$500 \times .08 = \$40$, interest, Ans.

53. $\$1380 - \$1200 = \$180$, interest.
$\$1200 \times .06 = \$72$; $\$180 \div \$72 = 2\frac{1}{2} = 2$ y. 6 mo.

Oct. 15, 1896 − 2 y. 6 mo. = Apr. 15, 1894, Ans.

54. $1\frac{1}{2}\%$ a month $= 1\frac{1}{2}\% \div 30 = \frac{1}{20}\%$ a day.
$\$1 \times \frac{1}{20} \times 63 = \$0.0315$, bank discount of $\$1$ for 63 d.
$\$1 - \$0.0315 = \$0.9685$, proceeds of $\$1$.

$\$5811 \div \$0.9685 = \$6000$, face of note, Ans.

55. 4 mo. 3 d. after Aug. 22 = Dec. 25.

Since the note becomes due on a legal holiday, it must be paid one day earlier, or Dec. 24, Ans.

56. $\$1 \times .06 \times 4 = \$0.24$; $\$1 + \$0.24 = \$1.24$.

$\$477.71 \div \$1.24 = \$385.25$, present worth, Ans.

57. $\$1 \times .07 \times \frac{72}{360} = \$0.014$; $\$1 + \$0.014 = \$1.014$.
$\$900 \div \$1.014 = \$887.57$, present worth.

$\$900 - \$887.57 = \$12.43$, discount, Ans.

58. $\$1 \times .06 \times 1\frac{1}{3} = \$0.08$; $\$1 + \$0.08 = \$1.08$.
$\$576 \div \$1.08 = \$533.33$, present worth.
$\$576 - \$533.33 = \$42.67$, discount.
$\$576 \times .06 \times 1\frac{1}{3} = \$46.08$, interest.

$\$46.08 - \$42.67 = \$3.41$, Ans.

59. Term of discount, 93 days...Face of note, $368.

Interest for	60	"	.....	3.68
" "	30	"	.....	1.84
" "	3	"	.....	.184
			Bank discount,	$5.70 } Ans.
			Proceeds,	$362.30 }

60. 63 days after Jan. 31, 1898, = Apr. 4, 1898, Ans.

61. $\$1 \times .07 \times 3 = \$0.21$; $\$1 + \$0.21 = \$1.21$.
$\$4235 \div \$1.21 = \$3500$, present worth.

$\$3675 - \$3500 = \$175$, loss, Ans.

62. Bank discount of $1 for 33 d. at 6% = $0.0055.
Proceeds of $1 = $1 − $0.0055 = $0.9945.

$\$500 \div \$0.9945 = \$502.77$, face of note, Ans.

63. $\$750 \times .07\frac{1}{2} \times \frac{7}{24} = \$16.41$, int. of $750 for 3 mo. 15 d.
$\$750 + \$16.41 = \$766.41$, amount of $750.

Bank discount of $1 for 48 d. at 7% = 0.009\frac{1}{3}$.
Proceeds of $1 = $1 − 0.009\frac{1}{3}$ = 0.990\frac{2}{3}$.

$\$766.41 \div \$0.990\frac{2}{3} = \$773.63$, face of note, Ans.

64. 1 A. = 43560 sq. ft.; $43560 \times .05 = \$2178$, sold for.
Bank discount of $1 for 6 mo. 3 d. at 5% = 0.0254\frac{1}{6}$.
Bank discount of $2178 = 2178 × 0.0254\frac{1}{6}$ = $55.36.
Proceeds of $2178 = $2178 − $55.36 = $2122.64.

$\$2122.64 - \$400 = \$1722.64$, profit, Ans.

Article 314.

8. $102\frac{1}{4}\% + \frac{1}{4}\% = 102\frac{1}{2}\%$; $102\frac{1}{2}\%$ of $\$2000 = \$2050$, Ans.

9. $113\frac{1}{2}\% + \frac{1}{8}\% = 113\frac{5}{8}\%$;
$113\frac{5}{8}\%$ of $\$30000 = \$34087.50$, Ans.

10. $101\frac{1}{2}\%$ of $\$1250 = \$1268.75$, Ans.

12. $\$100 \times 25 = \$2500$, par value.
$\frac{1}{8}\%$ of $\$2500 = \$3.125$, brokerage.
$\$3206.25 - \$3.125 = \$3203.12\frac{1}{2}$.
$\$3203.12\frac{1}{2} \div 25 = \$128.12\frac{1}{2}$, Ans.

13. $\$1$ in gold $= \$1.01\frac{3}{4}$ in currency.
$\$126.75 \div 1.01\frac{3}{4} = \$124.57\frac{1}{7}\frac{1}{0}\frac{1}{7}$, Ans.

14. $\$100 \times 10 = \$1000$, par value.
$\frac{1}{4}\%$ of $\$1000 = \$2.50$, the brokerage.
$\$1302.50 - \$2.50 = \$1300$, the market value.
$\$1300 \div 10 = \$130$, market value of 1 share, Ans.

16. $105\frac{3}{4}\% + \frac{1}{4}\% = 106\%$.
$\$2650 \div 1.06 = \$2500$, par value.
$\$2500 \times .05 = \$125$, yearly income, Ans.

17. $86\% + \frac{1}{4}\% = 86\frac{1}{4}\%$.
$\$6900 \div .86\frac{1}{4} = \$8000$, par value.
$\$8000 \times .04\frac{1}{2} = \$360$, yearly income, Ans.

18. $105\frac{3}{4}\% + \frac{1}{4}\% = 106\%$; $\$2650 \div 1.06 = \$2500$, par value
$\$2500 \times .06 = \$150$, yearly income.

$104\frac{1}{4}\% + \frac{1}{4}\% = 104\frac{1}{2}\%$; $\$3135 \div 1.04\frac{1}{2} = \$3000$, par value
$\$3000 \times .05 = \$150$, yearly income.

Ans. Each yields the same income.

20. $\$900 \div .04\frac{1}{2} = \$20000$, par value of stock.
$\$20000 \times 1.05\frac{1}{2} = \$21100$, amount to be invested, Ans.

21. $\$1050 \div .07 = \$15000$, par value of stock.
$\$15000 \times 1.09 = \$16350$, amount to be invested, Ans.

22. $\$2500 \div .05 = \$50000$, par value of stock.
$\$50000 \times 1.09 = \$54500$, amount to be invested, Ans.

24. The annual income of a share of 5% stock is $\$5$.
If the cost is $\$110$, the income is $\frac{5}{110}$, or $\frac{1}{22}$, or $4\frac{6}{11}\%$ of the cost, Ans.

25. The annual income of a share of 6% stock is $\$6$.
If the cost is $\$120$, the income is $\frac{6}{120}$, or $\frac{1}{20}$, or 5% of the cost.

The annual income of a share of 5% stock is $\$5$.
If the cost is $\$105$, the income is $\frac{5}{105}$, or $\frac{1}{21}$, or $4\frac{16}{21}\%$ of the cost. $5\% - 4\frac{16}{21}\% = \frac{5}{21}\%$.

Ans. Railroad 6's $\frac{5}{21}\%$ greater.

26. The annual income of a share of 8% stock is $\$8$.
If the cost is $\$125$, the income is $\frac{8}{125}$, or $6\frac{2}{5}\%$ of the cost, Ans.

28. A 6% stock yields $\$6$ on an investment of $\$100$.
If the $\$6$ is 7% of the investment, $1\% = \frac{1}{7}$ of $\$6$.
100% of the investment $= 100 \times \frac{1}{7}$ of $\$6$, or $\$85\frac{5}{7}$, Ans.

29. A 8% stock yields $\$8$ on an investment of $\$100$.
If the $\$8$ is 6% of the investment, $1\% = \frac{1}{6}$ of $\$8$.
100% of the investment $= 100 \times \frac{1}{6}$ of $\$8$, or $\$133\frac{1}{3}$, Ans.

Article 323.

5. $\$1164 \times .01 = \$11.64$, premium.
$\$1164 + \$11.64 = \$1175.64$, cost of the draft, Ans.

6. $4000 × .025 = $100, discount.

$4000 − $100 = $3900, cost of the draft, Ans.

7. $2517.70 × .00⅛ = 3.14\frac{47}{80}$, premium.

$2517.70 + 3.14\frac{47}{80}$ = 2520.84\frac{47}{80}$, cost of the draft, Ans.

9. $1 + $0.00125 = $1.00125, cost of $1 of the draft.

$2520.84 ÷ $1.00125 = $2517.69+, face of the draft, Ans.

10. $1 − $0.025 = $0.975, cost of $1 of the draft.

$3900 ÷ $0.975 = $4000, face of the draft, Ans.

11. $1 + $0.01 = $1.01, cost of $1 of the draft.

$1175.64 ÷ $1.01 = $1164, face of the draft, Ans.

12. $1 − $0.00625 = $0.99375, cost of $1 of the draft.

$447.18¾ ÷ $0.99375 = $450, face of the draft, Ans.

14. $1 × .995 = $0.995, cost of $1 at sight at ½% discount.
$0.995 × 1500 = $1492.50, cost of $1500 " "
$1500 × 0.01225 = $18.375, discount.

$1492.50 − $18.375 = $1474.12½, cost of the draft, Ans.

15. $1 × 1.01 = $1.01, cost of $1 at sight at 1% premium.
$1.01 × 3000 = $3030, cost of $3000.
$3000 × 0.0105 = $31.50, discount.

$3030 − $31.50 = $2998.50, cost of the draft, Ans.

17. $1 × 0.0055 = $0.0055, int. of $1 for 33 days.
$1 − $0.0055 = $0.9945, cost of $1 of exchange.

$3978 ÷ $0.9945 = $4000, face of the draft, Ans.

18. $1 − $0.005 = $0.995, cost of $1 at sight.
$1 × 0.01225 = $0.01225, int. of $1 for 63 days.
$0.995 − $0.01225 = $0.98275, cost of $1 of exchange.
$491.37½ ÷ 0.98275 = $500, face of the draft, Ans.

19. $1 + $0.01 = $1.01, cost of $1 at sight.
$1 × 0.0055 = $0.0055, int. of $1 for 33 days.
$1.01 − $0.0055 = $1.0045, cost of $1 of exchange.
$2998.50 ÷ 1.0045 = $2985.067+, face of the draft, Ans.

Article 330.

21. $777.94 ÷ 4.85 = £160.4 = £160 8*s.*, Ans.

22. £1320 10*s.* = £1320.5.
$4.87½ × 1320.5 = $6437.43¾, Ans.

23. $1 = 5.15 francs; 2380 ÷ 5.15 = 462.13\frac{61}{103}$, Ans.

24. $1 = 5.19 francs; 1500 ÷ 5.19 = 289.01\frac{127}{173}$, Ans.

25. $1 = 5.20 francs; 3195 × 5.20 f. = 16614 f., Ans.

26. $\frac{1304}{4}$ × $0.95 = $309.70, Ans.

27. Exchange = $0.95½ per 4 reichsmarks.
$0.95½ ÷ 4 = $0.23⅞ per 1 reichsmark.
$1420.20 ÷ $0.23⅞ = 5948$\frac{82}{191}$ reichsmarks, Ans.

28. £1254 15*s.* 6*d.* = £1254.775;
1254.775 × $4.87½ = $6117.03, Ans.

29. 1042.50 × 5.21¼ francs = 5434.03⅛ francs, Ans.

Article 334.

7. Jan. 3 + 30 days = Feb. 2, $150 is due.
Jan. 15 + 3 mo. = Apr. 15, or 72 d. after Feb. 2, $125 is due.
Feb. 1 + 60 d. = Apr. 2, or 59 d. after Feb. 2, $200 is due.

150
125 × 72 days = 9000 days.
200 × 59 " = 11800 "
475) 20800 "
44 days.

Feb. 2 + 44 d. = Mar. 18, average time, Ans.

8. 40 × 3 mo. = 120 mo.
60 × 5 " = 300 "
100) 420 "
$4\frac{1}{5}$ mo., or 4 mo. 6 d.

May 7 + 4 mo. 6 d. = Sept. 13, average time, Ans.

9. 250
350 × 2 = 700 mo.
400 × 6 = 2400 "
1000) 3100 "
$3\frac{1}{10}$ mo., or 3 mo. 3 d., average time, Ans.

10. 170 × 40 days = 6800 days.
200 × 60 " = 12000 "
150 × 90 " = 13500 "
520) 32300 "
62 days.

May 16, 1891, + 62 days = July 17, 1891, equated time, Ans.

11. Apr. 15, $200 is due.
May 1, or 16 days after Apr. 15, $311 is due.
June 1, or 47 " " " $160 "

200
311 × 16 = 4976 days.
160 × 47 = 7520 "
671) 12496 "
19 days.

Apr. 15 + 19 days = May 4, average time, Ans.

12. 800 × 30 days = 24000 days.
500 × 60 " = 30000 "
120 × 90 " = 10800 "
1420) 64800 "
46 days, average time, Ans.

Article 335.

13. July 5, $600 is due.
July 15, or 10 days after July 5, $400 is due.
Aug. 10, or 36 " " " $500 "

600
400 × 10 days = 4000 days.
500 × 36 " = 18000 "
1500) 22000 "
15 days.

July 5, 1891, + 15 d. + 60 d. = Sept. 18, 1891, average time, Ans.

14. Sept. 9, $140 is due.
Oct. 9, or 30 days after Sept. 9, $160 is due.
Nov. 6, or 58 " " " $200 "

140
160 × 30 days = 4800 days.
200 × 58 " = 11600 "
500) 16400 "
33 days.

Sept. 9, 1896, + 33 d. + 4 m. = Feb. 12, 1897, average time, Ans.

15. Apr. 11, $450 is due.
Apr. 30, or 19 days after Apr. 11, $600 is due.
May 16, or 35 days after Apr. 11, $400 is due.

450
600 × 19 days = 11400 days.
400 × 35 " = 14000 "
1450) 25400 "
$17\frac{1}{29} = 18$ days.

Apr. 11, 1897, + 18 d. + 63 d. = July 1, 1897, average date, Ans.

16. July 2, $225 is due.
Aug. 4, or 33 days after July 2, $360 is due.
Sept. 10, or 70 " " " $500 "
Sept. 24, or 84 " " " $320 "

225
360 × 33 days = 11880 days.
500 × 70 " = 35000 "
320 × 84 " = 26880 "
1405) 73760 "
52 days.

July 2, 1897, + 52 d. + 6 mo. = Feb. 23, 1898, average time, Ans.

Article 336.

17. $\frac{2\frac{1}{2}}{3\frac{3}{4}} = \frac{\cancel{5}}{\cancel{2}} \times \frac{\overset{2}{\cancel{4}}}{\cancel{15}_{3}} = \frac{2}{3}$ of $100\% = 66\frac{2}{3}\%$, Ans.

18. $\frac{\overset{337}{\cancel{2359}}}{\cancel{5}} \times \frac{\overset{20}{\cancel{100}}}{1} = \$6740$, Ans.

19. $\frac{3}{4}$ of $\$1200 = \$900$; 17% of $\$900 = \$153$, gain.

$\$900 + \$153 = \$1053$, Ans.

20. $\$360 = 80\%$; $\frac{\overset{90}{\cancel{360}}}{\cancel{4}} \times \frac{\overset{5}{\cancel{100}}}{1} = \$450$, value.

$\$450 \times 1.30 = \$585$, Ans.

21. $50 \times 10 = 500$ words; $500 - 75 = 425$, spelled correctly.

$\frac{425}{500} = \frac{17}{20}$ of $100\% = 85\%$, Ans.

22. The year 1880 = 366 d.; June 15 = 167 d. from Jan. 1.

$\frac{167}{366}$ of $100\% = 45\frac{111}{183}\%$, Ans.

23. $\$232.75 = 95\%$; $\frac{\$232.75}{95} \times 100 = \$245.00$.

$\$245.00 - \$232.75 = \$12.25$, discount, Ans.

24.

12 Webster's Unabridged Dict. @ $9.50, 10% off, = $102.60
15 Longfellow's Poems..... " $1.50, 5% " = 21.37½
$123.97½

$123.97½ × .03 = 3.71\frac{37}{40}$, discount.

$123.97½ − 3.71\frac{37}{40}$ = 120.25\frac{33}{40}$, cost, Ans.

25. Time = 1 y. 5 mo. 28 d.

2) $325 = Principal.
1.625 = 1 month's interest.
17$\frac{1}{3}$ = Time in months.
11375
1625
1516$\frac{2}{3}$
$29.141 = Interest at 6%.
6.071 = " " 1¼%.
$35.212 = " " 7¼%, Ans.

26. $922 × .05 = $46.10; $53.78½ ÷ $46.10 = $1\frac{43}{230}$ y., or 1 y. 2 mo., Ans.

27. Bank discount of a $1 note for 63 d. at 6% = $0.0105.
Proceeds of a $1 note = $1 − $0.0105 = $0.9895.

$593.70 ÷ $0.9895 = $600, face of note, Ans.

28. $774.40 − $640 = $134.40, interest.
$640 × .01 × 3½ = $22.40.

$134.40 ÷ $22.40 = 6, Ans.

29. ⅔ of $6000 = $4000.
$6000 × .08 = $480.

$4000 ÷ $480 = 8⅓ y. = 8 y. 4 mo., Ans.

30. The present worth of $1550 due in 30 days is $1550 ÷ $1.005 = $1542.29.

$1550 − $1542.29 = $7.71, true discount.

5% of $1550 = $77.50, the discount offered for cash.

$77.50 − $7.71 = $69.79, difference, Ans.

31. $6415.50 × .05 × $3\frac{1}{2}$ = 1122.71\frac{1}{4}$, simple interest.

$1 × .05 × $3\frac{1}{2}$ = 0.17\frac{1}{2}$; $1 + 0.17\frac{1}{2}$ = 1.17\frac{1}{2}$.

$6415.50 ÷ 1.17\frac{1}{2}$ = $5460, present worth.

$6415.50 − $5460 = $955.50, discount.

1122.71\frac{1}{4}$ − $955.50 = 167.21\frac{1}{4}$, Ans.

32. $1300 × .07 × 4 = $364, simple interest.

Principal for 1st year	$1300.00
Interest " "	91.00
Principal for 2d year	$1391.00
Interest " "	97.37
Principal for 3d year	$1488.37
Interest " "	104.19
Principal for 4th year	$1592.56
Interest " "	111.48
Compound amount for 4 years	$1704.04
Given principal	1300.00
Compound interest for four years . . .	$404.04

$404.04 − $364 = $40.04, Ans.

33.

Principal	$2000.00
Int. from Jan. 1, 1896, to July 1, 1896, 6 m.	60.00
Amount	$2060.00
1st payment	500.00
New principal	$1560.00
Int. from July 1, 1896, to Jan. 1, 1898, 1y. 6m.	140.40
Amount due Jan. 1, 1898 . . . . Ans.	$1700.40

34. The annual income of a share of 4 % stock is $ 4.
If the cost is $ 92, the income is $\frac{4}{92}$, or $\frac{1}{23}$, or $4\frac{8}{23}$ % of the cost.

The annual income of a share of 5 % stock is $ 5.
If the cost is $ 110, the income is $\frac{5}{110}$, or $\frac{1}{22}$, or $4\frac{8}{11}$ % of the cost.

$$4\tfrac{8}{11}\% - 4\tfrac{8}{23}\% = \tfrac{1}{506}.$$

$$\$82.50 = \frac{1}{506}; \quad \frac{506}{506} = 506 \times \$82.50 = \$41745, \text{ Ans.}$$

35. $ 26250 ÷ .87½ = $ 30000, face of bonds.
$ 30000 × .91 = $ 27300, proceeds of sale.

$ 27300 − $ 26250 = $ 1050, gain, Ans.

36. $ 9080 ÷ .85⅛ = $ 10666⅔, par value.
$ 10666⅔ × .03 = $ 320, yearly income.

$ 9800 ÷ 1.22½ = $ 8000, par value.
$ 8000 ÷ .05 = $ 400, yearly income.

$ 400 − $ 320 = $ 80, Ans.

37.

100	×	50 days	=	5000 days.
130	×	40 "	=	5200 "
230	×	140 "	=	32200 "
460			)	42400 "

$92\frac{4}{23}$ = 92 days, Ans.

38.

$ 2660 × .0105 = $ 27.93, int. of $ 2660 for 63 d. at 6 %.
$ 2570.89 + $ 27.93 = $ 2598.82, cost of $ 2660 at sight.
$ 2598.82 ÷ $ 2660 = $97\frac{7}{10}$ % of face of draft.

$100\% - 97\tfrac{7}{10}\% = 2\tfrac{3}{10}\%$, discount, Ans.

39.

Principal		$500.00
Int. from Oct. 8, 1896, to Nov. 4, 1897, 1 y. 27 d. .		32.25
Int. from Nov. 4, 1897, to Jan. 30, 1898, 2 m. 26 d.		7.17
Amount		$539.42
1st payment, less than interest due	$30	
2d "	250	280.00
New principal		$259.42
Int. from Jan. 30, 1898, to July 1, 1898, 5 m. 1 d. .		6.53
Amount due July 1, 1898 . . . . . Ans.		$265.95

40. 800×4 mo. $= 3200$ months' credit due me.
100×2 " $= 200$ " " used.
200×3 " $= 600$ " " "
500 $)2400$ " " still due me.
$4\frac{4}{5}$ " " due on $500.

$4\frac{4}{5}$ mo. $-$ 4 mo. $= \frac{4}{5}$ mo. $= 24$ days, Ans.

Article 348.

27. $14 : 7 = 18 : 9$ $\quad \frac{\overset{9}{\cancel{7} \times \cancel{18}}}{\cancel{14}_{\cancel{2}}} = 9$, Ans.

28. $5 : 20 = 15 : 60$ $\quad \frac{\overset{3}{5 \times \cancel{60}}}{\cancel{20}} = 15$, Ans.

29. $40 : 8 = 65 : 13$ $\quad \frac{\overset{5}{8 \times \cancel{65}}}{\cancel{13}} = 40$, Ans.

30. $648 : 243 = 24 : 9$ $\quad \frac{\overset{9}{\cancel{243} \times 24}}{\cancel{648}_{27}} = 9$, Ans.

31. $\frac{1}{6} : \frac{1}{3} :: 4 : 8$ $\quad \frac{\overset{2}{\cancel{1}} \times \overset{8}{\cancel{8}}}{\underset{3}{\cancel{6}} \times \cancel{4}} = \frac{1}{3}$, Ans.

32. $45 : 24 :: 15 : 8$ $\quad \frac{\overset{8}{\cancel{24}} \times \cancel{15}}{\underset{3}{\cancel{45}}} = 8$, Ans.

33. $30 : 9 :: 60 : 18$ $\quad \frac{\overset{30}{\cancel{9}} \times \cancel{60}}{\underset{2}{\cancel{18}}} = 30$, Ans.

34. $5 : \frac{1}{2} :: \$75.00 : \$7.50$ $\quad \frac{5 \times 2 \times 7.50}{1} = \$75$, Ans.

Article 349.

36. $12 : 30 :: \$51 : \$x$ $\quad \frac{\overset{5}{\cancel{30}} \times 51}{\underset{2}{\cancel{12}}} = \$127.50$, Ans.

37. $183 : 61 = \$273 : \$x$ $\quad \frac{\overset{91}{\cancel{61}} \times \cancel{273}}{\underset{3}{\cancel{183}}} = \$91$, Ans.

38. $16 : 48 = 30 : x$ $\quad \frac{\overset{3}{\cancel{48}} \times 30}{\cancel{16}} = 90$ men, Ans.

39. $20 : 24 = 15 : x$ $\quad \frac{\overset{6}{\cancel{24}} \times \overset{3}{\cancel{15}}}{\underset{4}{\cancel{20}}} = 18$ days, Ans.

Article 350.

40. 15 : 79 :: \$120 : \$$x$ $\quad \frac{79 \times \overset{8}{\cancel{120}}}{\underset{}{\cancel{15}}} = \$632$, Ans.

41. 7 : 27 :: \$5.58 : \$$x$ $\quad \frac{27 \times \overset{84}{\cancel{5.58}}}{\underset{}{\cancel{7}}} = \$22.68$, Ans.

42. 11 : 47 :: 319 : x $\quad \frac{47 \times \overset{29}{\cancel{319}}}{\underset{}{\cancel{11}}} = 1363$ miles, Ans.

43. 36 : 27 :: 12 : x $\quad \frac{\overset{9}{\cancel{27}} \times \cancel{12}}{\underset{3}{\cancel{36}}} = 9$ days, Ans.

44. 98 : 7 :: \$441 : \$$x$ $\quad \frac{\overset{63}{\cancel{7}} \times \cancel{441}}{\underset{\cancel{14}\ 2}{\cancel{98}}} = \$31\frac{1}{2}$, Ans.

45. 24 : 18 :: 15 : x $\quad \frac{\overset{3}{\cancel{18}} \times 15}{\underset{4}{\cancel{24}}} = 11\frac{1}{4}$ days, Ans.

46. 2700 : 2100 :: 9 : x $\quad \frac{\overset{7}{\cancel{2100}} \times 9}{\underset{9}{\cancel{2700}}} = 7$ mo., Ans.

47. $4\frac{7}{8} : 19\frac{1}{2}$ :: \$$2\frac{7}{8}$: \$$x$ $\quad \frac{\cancel{8} \times \cancel{39} \times 23}{\cancel{39} \times 2 \times \cancel{8}} = \$11\frac{1}{2}$, Ans.

48. $54 : 74 :: 30 : x$ $\quad \dfrac{74 \times \overset{5}{\cancel{30}}}{\underset{9}{\cancel{54}}} = 41\frac{1}{9}$ days, Ans.

49. $2\frac{2}{3} : 3\frac{1}{4} :: 6336 : x$ $\quad \dfrac{3 \times 13 \times \overset{198}{\cancel{6336}}}{\cancel{3} \times \cancel{4}} = 7722$, Ans.

50. $3\frac{3}{4} : 4\frac{5}{8} :: \$27.50 : x$ $\quad \dfrac{\cancel{4} \times 37 \times \overset{2.75}{\cancel{27.50}}}{\underset{3}{\cancel{15}} \times \underset{2}{\cancel{8}}} = \$33.91\frac{2}{3}$, Ans.

51. $108 : 72 :: 288 : x$ $\quad \dfrac{\overset{24}{\cancel{72}} \times \overset{8}{\cancel{288}}}{\underset{3}{\cancel{108}}} = 192$ men.

288 men — 192 men = 96 men, Ans.

52. $3\frac{1}{2} : 12\frac{1}{8} :: \$11.37\frac{1}{2} : x$ $\quad \dfrac{\cancel{2} \times 97 \times \overset{3.25}{\cancel{22.75}}}{\cancel{7} \times 8 \times \cancel{2}} = \$39.40\frac{5}{8}$, Ans.

Article 352.

54. $\left.\begin{matrix} 3 : 2 \\ 2 : 6 \end{matrix}\right\} :: 108 : x$ $\quad \dfrac{\overset{2}{\cancel{2}} \times \cancel{6} \times 108}{\cancel{3} \times \cancel{2}} = 216$, Ans.

55. $\left.\begin{matrix} \$500 : \$250 \\ \$175 : \$360 \end{matrix}\right\} :: 7 : x$ $\quad \dfrac{\cancel{250} \times \overset{72}{\cancel{360}} \times 7}{\underset{2}{\cancel{500}} \times \underset{35}{\cancel{175}}} = 7\frac{1}{5}$ y., Ans.

56. $\left.\begin{matrix} 76 : 114 \\ 9 : 6 \end{matrix}\right\} :: 24 : x$ $\quad \dfrac{\overset{2}{\cancel{38}} \quad 2 \quad 6}{\underset{19}{\cancel{114}} \times \cancel{6} \times \underset{3}{\cancel{24}}} = 24$ men, Ans.

57. $\left.\begin{matrix}5 & : 10\\ 10\frac{1}{2} & : 14\end{matrix}\right\} :: 6 : x$ $\quad \frac{\overset{2}{\cancel{10}} \times \overset{2}{\cancel{14}} \times \overset{2}{\cancel{6}} \times 2}{\underset{3}{\cancel{5}} \times \cancel{21}} = 16$ acres, Ans.

58. $\left.\begin{matrix}28 & : 15\\ 7\frac{1}{2} & : 4\end{matrix}\right\} :: 16 : x$ $\quad \frac{\cancel{15} \times \cancel{4} \times 16 \times 2}{\underset{7}{\cancel{28}} \times \cancel{15}} = 4\frac{4}{7}$, Ans.

59. $\left.\begin{matrix}10 & : 15\\ 8 & : 7\end{matrix}\right\} :: \$8 : x$ $\quad \frac{\overset{3}{\cancel{15}} \times 7 \times \cancel{8}}{\underset{2}{\cancel{10}} \times \cancel{8}} = \$10\frac{1}{2}$, Ans.

60. $\left.\begin{matrix}15 & : 20\\ 9 & : 12\end{matrix}\right\} :: 117 : x$ $\quad \frac{\overset{4}{\cancel{20}} \times \overset{4}{\cancel{12}} \times \overset{13}{\cancel{117}}}{\underset{3}{\cancel{15}} \times \cancel{9}} = 208$ miles, Ans.

61. $\left.\begin{matrix}96 & : 150\\ 1 & : 6\end{matrix}\right\} :: 192 : x$ $\quad \frac{150 \times 6 \times \overset{2}{\cancel{192}}}{\cancel{96} \times 1} = 1800$ tons, Ans.

62. $\left.\begin{matrix}250 & : 400\\ 10 & : 12\end{matrix}\right\} :: 9 : x$ $\quad \frac{\overset{40}{\cancel{400}} \times 12 \times 9}{250 \times \cancel{10}} = 17\frac{7}{25}$ days, Ans.

63. $\left.\begin{matrix}6 & : 8\\ 84 & : 200\end{matrix}\right\} :: 16 : x$ $\quad \frac{\overset{2}{\cancel{8}} \times 200 \times 16}{\underset{3}{\cancel{6}} \times \underset{21}{\cancel{84}}} = 50\frac{5}{63}$ weeks, Ans.

64. $\left.\begin{matrix}6 & : 12\\ 4 & : 9\end{matrix}\right\} :: 16 : x$ $\quad \frac{\overset{3}{\cancel{12}} \times 9 \times \overset{8}{\cancel{16}}}{\underset{2}{\cancel{4}} \times \cancel{6}} = 72$ acres, Ans.

65. $\left.\begin{matrix}20 & : 100\\ 6 & : 4\end{matrix}\right\} :: 180 : x$ $\quad \frac{\overset{5}{\cancel{100}} \times 4 \times \overset{30}{\cancel{180}}}{20 \times \cancel{6}} = 600$ bricks, Ans.

66. $\left.\begin{matrix}34:8\\6:36\\9:12\end{matrix}\right\}::90:x$ $\quad \dfrac{\overset{4}{\cancel{8}}\times\overset{6}{\cancel{36}}\times 12\times\overset{10}{\cancel{90}}}{\underset{17}{\cancel{34}}\times\cancel{6}\times\cancel{9}}=169\frac{7}{17}$ cd., Ans.

67. $\left.\begin{matrix}30:12\\30:300\\6:8\\3:6\\8:12\end{matrix}\right\}::15:x$ $\quad \dfrac{\overset{2}{\cancel{12}}\times\overset{10}{\cancel{300}}\times\overset{8}{\cancel{8}}\times\cancel{6}\times 12\times\cancel{15}}{\underset{2}{\cancel{30}}\times\cancel{30}\times\cancel{6}\times\cancel{3}\times\cancel{8}}=$ 240 days, Ans.

68. $\left.\begin{matrix}20:12\\2\frac{1}{2}:3\end{matrix}\right\}::\$4:\$x$ $\quad \dfrac{12\times 3\times\cancel{4}}{\underset{5}{\cancel{20}}\times 2\frac{1}{2}}=\$2.88$, Ans.

69. $\left.\begin{matrix}67\frac{1}{2}:450\\18:8\\3\frac{3}{8}:4\frac{1}{2}\end{matrix}\right\}::2\frac{1}{2}:x$ $\quad \dfrac{\overset{4}{\cancel{2}}\times\cancel{8}\times 9\times 5\times\overset{3}{\cancel{6}}\times\overset{10}{\cancel{450}}}{\underset{3}{\cancel{135}}\times\underset{2}{\cancel{18}}\times\cancel{2}\times\cancel{2}\times 23}=$ $8\frac{18}{23}$ ft., Ans.

70. $\left.\begin{matrix}48:52\\8:14\end{matrix}\right\}::\$1200:\$x$ $\quad \dfrac{\overset{13}{\cancel{52}}\times\overset{7}{\cancel{14}}\times\overset{25}{\cancel{1200}}}{\underset{2}{\cancel{48}}\times\cancel{8}}=\$2275.$

$\$2275\div 12=\$189\frac{7}{12}$, per month, Ans.

Article 356.

7. $\$6000+\$9000+\$5000=\$20000$, the capital.

A's stock $=\dfrac{6000}{20000}=\dfrac{3}{10}$; $\dfrac{3}{10}$ of $\$1680=\$504$, A's gain.

B's " $=\dfrac{9000}{20000}=\dfrac{9}{20}$; $\dfrac{9}{20}$ of $\$1680=\$756$, B's gain.

C's " $=\dfrac{5000}{20000}=\dfrac{1}{4}$; $\dfrac{1}{4}$ of $\$1680=\$420$, C's gain.

Article 357.

8. $1280 + $1760 + $1920 = $4960, the capital.

A's stock $= \frac{1280}{4960} = \frac{8}{31}$; $\frac{8}{31}$ of $2790 = $720, A's gain.

B's " $= \frac{1760}{4960} = \frac{11}{31}$; $\frac{11}{31}$ of $2790 = $990, B's "

C's " $= \frac{1920}{4960} = \frac{12}{31}$; $\frac{12}{31}$ of $2790 = $1080, C's "

9. $1750 + $2100 + $2650 = $6500, the capital.

A's stock $= \frac{1750}{6500} = \frac{7}{26}$; $\frac{7}{26}$ of $4225 = $1137.50, A's share.

B's " $= \frac{2100}{6500} = \frac{21}{65}$; $\frac{21}{65}$ of $4225 = $1365, B's share.

C's " $= \frac{2650}{6500} = \frac{53}{130}$; $\frac{53}{130}$ of $4225 = $1722.50, C's share.

10. $1200 + $1600 = $2800, the capital.

Hall's stock $= \frac{1200}{2800} = \frac{3}{7}$; $\frac{3}{7}$ of $728 = $312, Hall's gain.

Bishop's " $= \frac{1600}{2800} = \frac{4}{7}$; $\frac{4}{7}$ of $728 = $416, Bishop's gain.

11. 400 bbl. + 600 bbl. + 400 bbl. = 1400 bbl.

B's stock $= \frac{400}{1400} = \frac{2}{7}$; $\frac{2}{7}$ of 360 bbl. $= 102\frac{6}{7}$ bbl., B's loss.

C's " $= \frac{600}{1400} = \frac{3}{7}$; $\frac{3}{7}$ of 360 " $= 154\frac{2}{7}$ " C's "

D's " $= \frac{400}{1400} = \frac{2}{7}$; $\frac{2}{7}$ of 360 " $= 102\frac{6}{7}$ " D's "

12. 8 horses + 6 horses + 10 horses = 24 horses.

A's stock $= \frac{8}{24} = \frac{1}{3}$; $\frac{1}{3}$ of \$ 300 = \$ 100, A's share.

B's " $= \frac{6}{24} = \frac{1}{4}$; $\frac{1}{4}$ of \$ 300 = \$ 75, B's share.

C's " $= \frac{10}{24} = \frac{5}{12}$; $\frac{5}{12}$ of \$ 300 = \$ 125, C's share.

13 \$ 1400 + \$ 600 = \$ 2000, A's and B's stock.
\$ 180 − \$ 60 = \$ 120, A's and B's gain.

A's stock $= \frac{1400}{2000} = \frac{7}{10}$; $\frac{7}{10}$ of \$ 120 = \$ 84, A's gain.

B's " $= \frac{600}{2000} = \frac{3}{10}$; $\frac{3}{10}$ of \$ 120 = \$ 36, B's "

C's gain $= \frac{60}{180}$ of whole gain $= \frac{1}{3}$ of whole gain.

C's stock $= \frac{1}{3}$ of whole stock.

$\frac{2}{3}$ of stock = \$ 2000; $\frac{1}{3} = \frac{1}{2}$ of \$ 2000 = \$ 1000, C's stock

125 bbl. cost \$ 1000.
1 bbl. cost \$ 1000 ÷ 125 = \$ 8.

Article 358.

15. A's \$ 750 for 4 mo. = \$ 3000 for 1 mo.
B's \$ 850 " 8 " = 6800 "
C's \$ 800 " 12 " = 9600 "
The entire stock is the same as \$ 19400 "

$\frac{3000}{19400} = \frac{15}{97}$; $\frac{15}{97}$ of \$ 640 = \$ $98.96\frac{8}{97}$, A's loss.

$\frac{6800}{19400} = \frac{34}{97}$; $\frac{34}{97}$ of \$ 640 = \$ $224.32\frac{8}{97}$, B's "

$\frac{9600}{19400} = \frac{48}{97}$; $\frac{48}{97}$ of \$ 640 = \$ $316.70\frac{12}{97}$, C's "

16. A's \$5000 for 8 mo. = \$40000 for 1 mo.
B's \$4000 " 12 " = \$48000 "
C's \$3000 " 15 " = \$45000 "
The entire stock is the same as \$133000 "

$\frac{40000}{133000} = \frac{40}{133}$; $\frac{40}{133}$ of \$1330 = \$400, A pays.

$\frac{48000}{133000} = \frac{48}{133}$; $\frac{48}{133}$ of \$1330 = \$480, B "

$\frac{45000}{133000} = \frac{45}{133}$; $\frac{45}{133}$ of \$1330 = \$450, C "

17. A's 30 horses for 33 days = 990 horses for 1 day.
B's 21 " 42 " = 882 " " "
The entire stock is the same as 1872 " " "

$\frac{990}{1872} = \frac{55}{104}$; $\frac{55}{104}$ of \$46.80 = \$24.75, A pays.

$\frac{882}{1872} = \frac{49}{104}$; $\frac{49}{104}$ of \$46.80 = \$22.05, B "

18. A's \$500 for 9 mo. = \$4500 for 1 mo.
B's \$700 " 12 " = \$8400 "
C's \$400 " 15 " = \$6000 "
The entire stock is the same as \$18900 "

$\frac{4500}{18900} = \frac{5}{21}$; $\frac{5}{21}$ of \$300 = \$71$\frac{9}{21}$, A's loss.

$\frac{8400}{18900} = \frac{4}{9}$; $\frac{4}{9}$ of \$300 = \$133$\frac{1}{3}$, B's "

$\frac{6000}{18900} = \frac{20}{63}$; $\frac{20}{63}$ of \$300 = \$95$\frac{15}{21}$, C's "

19. A's $6000 for 6 mo. = $36000 for 1 mo.
A's $10000 " = 60000 "
A's entire stock is the same as $96000 "
B's $12000 for 8 mo. = $96000 "
B's $6000 " 4 " = 24000 "
B's entire stock is the same as $120000. "

$96000 + $120000 = $216000, the capital.

$\frac{96000}{216000} = \frac{4}{9}$; $\frac{4}{9}$ of $2160 = $960, A's gain.

$\frac{120000}{216000} = \frac{5}{9}$; $\frac{5}{9}$ of $2160 = $1200, B's "

20. A's $500 for 4 mo. = $2000 for 1 mo.
A's $800 " 8 " = 6400 "
A's entire stock is the same as $8400 "
B's $400 for 6 mo. = $2400 for 1 mo.
B's $900 " = 5400 "
B's entire stock is the same as $7800 "

$8400 + $7800 = $16200, the capital.

$\frac{8400}{16200} = \frac{42}{81}$; $\frac{42}{81}$ of $2400 = 1244\frac{4}{9}$, A's gain.

$\frac{7800}{16200} = \frac{39}{81}$; $\frac{39}{81}$ of $2400 = 1155\frac{5}{9}$, B's "

21. Wood's $6000 for 12 mo. = $72000 for 1 mo.
Furbush's $5000 for 10 mo. = 50000 "
Wood's and Furbush's stock = $122000 "

Interest of $4000 for 6 mo. at 6% = $120.

$\$\frac{1200}{2}$ or $600, + $120 = $720, Davis's share of profits

$3160 − $720 = $2440.

$\frac{72000}{122000} = \frac{36}{61}$; $\frac{36}{61}$ of $2440 = $1440, Wood's share of profits

$\frac{50000}{122000} = \frac{25}{61}$; $\frac{25}{61}$ of $2440 = $1000, Furbush's " " "

22. A's \$ 2000 for 7 mo. = \$ 14000 for 1 mo.
A's \$ 6000 " 5 " = 30000 "
A's entire stock = \$ 44000 "

B's \$ 3000 for 9 " = \$ 27000 "
B's \$ 2000 " 3 " = 6000 "
B's entire stock = \$ 33000 "

C's \$ 5000 for 8 " = \$ 40000 "

\$ 44000 + \$ 33000 + \$ 40000 = \$ 117000, entire stock for 1 mo.

$\frac{44000}{117000} = \frac{44}{117}$; $\frac{44}{117}$ of \$ 5850 = \$ 2200, A's gain.

$\frac{33000}{117000} = \frac{33}{117}$; $\frac{33}{117}$ of \$ 5850 = \$ 1650, B's "

$\frac{40000}{117000} = \frac{40}{117}$; $\frac{40}{117}$ of \$ 5850 = \$ 2000, C's "

Article 363.

8. 529.
9. 4096.
10. 28561.
11. $\frac{9}{16}$.
12. $15\frac{6}{8}$.
13. 12.96.
14. 15625.
15. 161051.
16. 0.003375.
17. 12.25.
18. $203\frac{1}{16}$.
19. 0.000343.

Article 375.

26. 92'16 (96, Ans.

```
   81
186 | 1116
     | 1116
```

27. 2'72'25 (165, Ans.

```
    1
26 | 172
   | 156
325| 1625
   | 1625
```

28. 18′23′29 (427, Ans.

```
   16
82 | 223
     164
847 | 5929
      5929
```

29. 71′74′09 (847, Ans.

```
   64
164 | 774
      656
1687 | 11809
       11809
```

30. 94′86′76 (974, Ans.

```
   81
187 | 1386
      1309
1944 | 7776
       7776
```

31. 6.′70′81 (2.59, Ans.

```
   4
45 | 270
     225
509 | 4581
      4581
```

32. 4.′20′25 (2.05, Ans.

```
   4
405 | 2025
      2025
```

33. 18′66.′24 (43.2, Ans.

```
   16
83 | 266
     249
862 | 1724
      1724
```

34. 0.′00′94′09 (0.097, Ans.

```
   00
    94
   81
187 | 1309
      1309
```

35. 0.′05′62′50 (0.237+, Ans.

```
   04
43 | 162
     129
467 | 3350
      3269
        81
```

36. 0.′94′09 (0.97, Ans.

```
   81
187 | 1309
      1309
```

37. 7′78′41 (279, Ans.

```
   4
47 | 378
     329
549 | 4941
      4941
```

38. 16.′24′09 (4.03, Ans.

```
   16
803 | 2409
      2409
```

39. 14.′89′96 (3.86, Ans.

```
    9
68  | 589
      544
766 | 4596
      4596
```

40. 39.′06′25 (6.25, Ans.

```
    36
122 | 306
      244
1245 | 6225
       6225
```

41. 5′38.′00′00 (23.19+, Ans.

```
     4
43   | 138
       129
461  | 900
       461
4638 | 43900
       41742
        2158
```

42.

71.′00′00′00 (8.426+, Ans.

```
     64
164  | 700
       656
1682 | 4400
       3364
16846 | 103600
        101076
          2524
```

43.

0.′00′20′00′00 (0.0447+, Ans.

```
     16
84   | 400
       336
887  | 6400
       6209
        191
```

Article 376.

45. $\sqrt{\frac{3721}{7569}} = \frac{\sqrt{3721}}{\sqrt{7569}} = \frac{61}{87}$, Ans.

46. $\sqrt{\frac{1899}{10339}} = \frac{\sqrt{9}}{\sqrt{49}} = \frac{3}{7}$, Ans.

47. $\sqrt{60\frac{1}{16}} = \frac{\sqrt{961}}{\sqrt{16}} = \frac{31}{4} = 7\frac{3}{4}$, Ans.

48. $\sqrt{37\frac{24}{49}} = \frac{\sqrt{1849}}{\sqrt{49}} = \frac{43}{7} = 6\frac{1}{7}$, Ans.

49. $\sqrt{49\frac{4}{9}} = \sqrt{49.444444+} = 7.031+$, Ans.

50. $\sqrt{\frac{450}{2048}} = \frac{\sqrt{225}}{\sqrt{1024}} = \frac{15}{32}$, Ans.

51. $\sqrt{72\frac{1}{4}} = \frac{\sqrt{289}}{\sqrt{4}} = \frac{17}{2} = 8\frac{1}{2}$, Ans.

52. $\sqrt{\frac{30}{32}} = \sqrt{0.9375} = 0.968+$, Ans.

53. $\sqrt{\frac{3}{4} + \frac{5}{6} + \frac{6}{9}} = \sqrt{2.25} = 1.5$, Ans.

54. $\sqrt{9817\frac{7}{9}} = \frac{\sqrt{8836}}{\sqrt{9}} = \frac{94}{3} = 31\frac{1}{3}$, Ans.

55. $\sqrt{146\frac{5}{8}} = \sqrt{146.625} = 12.108+$, Ans.

56. $\sqrt{81\frac{9}{25}} = \sqrt{81.36} = 9.019+$, Ans.

57. $\sqrt{\frac{7}{8}} = \sqrt{0.875} = 0.935+$, Ans.

58. $\sqrt{\frac{11}{16}} = \sqrt{0.6875} = 0.829+$, Ans.

59. 22′65′76 (476 men, Ans.

	16
87	665
	609
946	5676
	5676

60.

3 A. 1 sq. rd. = 481 sq. rd.
5 " 69 " = 869 "
6 " 91 " = 1051 "
481 sq. rd. + 869 sq. rd. + 1051 sq. rd. = 2401 sq. rd.

$\sqrt{2401} = 49$ rd., Ans.

Article 384.

64. 91′125 (45, Ans.

		64
$40^2 \times 3 =$	4800	27125
$40 \times 5 \times 3 =$	600	
$5^2 =$	25	
	5425	27125

65. 421′875 (75, Ans.

		343
$70^2 \times 3 =$	14700	78875
$70 \times 5 \times 3 =$	1050	
$5^2 =$	25	
	15775	78875

66. 571′787 (83, Ans.

		512
$80^2 \times 3 =$	19200	59787
$80 \times 3 \times 3 =$	720	
$3^2 =$	9	
	19929	59787

67.

912.′673 (9.7, Ans.
729

$90^2 \times 3 =$	24300	183673
$90 \times 7 \times 3 =$	1890	
$7^2 =$	49	
	26239	183673

68.

3′796′416 (156, Ans.
1

$10^2 \times 3 =$	300	2796
$10 \times 5 \times 3 =$	150	
$5^2 =$	25	
	475	2375
$150^2 \times 3 =$	67500	421416
$150 \times 6 \times 3 =$	2700	
$6^2 =$	36	
	70236	421416

69.

12′977′875 (235, Ans.
8

$20^2 \times 3 =$	1200	4977
$20 \times 3 \times 3 =$	180	
$3^2 =$	9	
	1389	4167
$230^2 \times 3 =$	158700	810875
$230 \times 5 \times 3 =$	3450	
$5^2 =$	25	
	162175	810875

70. 60′236.′288 (39.2, Ans.

27

$30^2 \times 3 =$	2700	33236
$30 \times 9 \times 3 =$	810	
$9^2 =$	81	
	3591	32319
$390^2 \times 3 =$	456300	917288
$390 \times 2 \times 3 =$	2340	
$2^2 =$	4	
	458644	917288

71. 101′847′563 (467, Ans.

64

$40^2 \times 3 =$	4800	37847
$40 \times 6 \times 3 =$	720	
$6^2 =$	36	
	5556	33336
$460^2 \times 3 =$	634800	4511563
$460 \times 7 \times 3 =$	9660	
$7^2 =$	49	
	644509	4511563

72. 258′474′853 (637, Ans.

216

$60^2 \times 3 =$	10800	42474
$60 \times 3 \times 3 =$	540	
$3^2 =$	9	
	11349	34047
$630^2 \times 3 =$	1190700	8427853
$630 \times 7 \times 3 =$	13230	
$7^2 =$	49	
	1203979	8427853

73 6′372.′783′864 (18.54, **Ans.**

		1	
$10^2 \times 3 =$	300	5372	
$10 \times 8 \times 3 =$	240		
$8^2 =$	64		
	604	4832	
$180^2 \times 3 =$	97200	540783	
$180 \times 5 \times 3 =$	2700		
$5^2 =$	25		
	99925	499625	
$1850^2 \times 3 =$	10267500	41158864	
$1850 \times 4 \times 3 =$	22200		
$4^2 =$	16		
	10289716	41158864	

75. 64′481.′201 (40.1, **Ans.**

		64	
$400^2 \times 3 =$	480000	481201	
$400 \times 1 \times 3 =$	1200		
$1^2 =$	1		
	481201	481201	

76. 37′259′704 (334, **Ans.**

		27	
$30^2 \times 3 =$	2700	10259	
$30 \times 3 \times 3 =$	270		
$3^2 =$	9		
	2979	8937	
$330^2 \times 3 =$	326700	1322704	
$330 \times 4 \times 3 =$	3960		
$4^2 =$	16		
	330676	1322704	

77.

0.′000′001′728 (0.012, Ans.

		1
$10^2 \times 3 =$	300	728
$10 \times 2 \times 3 =$	60	
$2^2 =$	4	
	364	728

78.

1′860′867 (123, Ans.

		1
$10^2 \times 3 =$	300	860
$10 \times 2 \times 3 =$	60	
$2^2 =$	4	
	364	728
$120^2 \times 3 =$	43200	132867
$120 \times 3 \times 3 =$	1080	
$3^2 =$	9	
	44289	132867

79.

8.′144′865′728 (2.012, Ans.

		8
$200^2 \times 3 =$	120000	144865
$200 \times 1 \times 3 =$	600	
$1^2 =$	1	
	120601	120301
$2010^2 \times 3 =$	12120300	24264728
$2010 \times 2 \times 3 =$	12060	
$2^2 =$	4	
	12132364	24264728

80.

0.′075′686′967 (0.423, Ans.

64

$40^2 \times 3 =$	4800	11686
$40 \times 2 \times 3 =$	240	
$2^2 =$	4	
	5044	10088
$420^2 \times 3 =$	529200	1598967
$420 \times 3 \times 3 =$	3780	
$3^2 =$	9	
	532989	1598967

81.

0.′008′649′000 (0.205+, Ans.

8

$200^2 \times 3 =$	120000	649000
$200 \times 5 \times 3 =$	3000	
$5^2 =$	25	
	123025	615125
		33875

82.

0.′000′007′000 (0.019+, Ans.

1

$10^2 \times 3 =$	300	6000
$10 \times 9 \times 3 =$	270	
$9^2 =$	81	
	651	5859
		141

83. $25'000'000$ ($2.92+$, **Ans.**

		8
$20^2 \times 3 =$	1200	17000
$20 \times 9 \times 3 =$	540	
$9^2 =$	81	
	1821	16389
$290^2 \times 3 =$	252300	611000
$290 \times 2 \times 3 =$	1740	
$2^2 =$	4	
	254044	508088
		102912

Article 385.

85. $\sqrt[3]{\frac{68921}{59319}} = \frac{\sqrt[3]{68921}}{\sqrt[3]{59319}} = \frac{41}{39} = 1\frac{2}{39}$, **Ans.**

86. $\sqrt[3]{49\frac{8}{27}} = \frac{\sqrt[3]{1331}}{\sqrt[3]{27}} = \frac{11}{3} = 3\frac{2}{3}$, **Ans.**

87. $\sqrt[3]{\frac{3}{5}} = \sqrt[3]{0.6} = 0.84+$, **Ans.**

88. $\sqrt[3]{\frac{5}{27}} = \sqrt[3]{0.185185+} = 0.57$, **Ans.**

89. $\sqrt[3]{81\frac{5}{11}} = \sqrt[3]{81.454545+} = 4.33+$, **Ans.**

90. $\sqrt[3]{166\frac{2}{3}} = \sqrt[3]{166.666666+} = 5.503+$, **Ans.**

91. $2150.42 \times 8 = 17203.36$ cu. in.

$\sqrt[3]{17203.36} = 25.81+$ in., **Ans.**

Article 390.

3. $20^2 + 15^2 = 400 + 225 = 625$; $\sqrt{625} = 25$ ft., Ans.

4. $157^2 - 132^2 = 24649 - 17424 = 7225$

$\sqrt{7225} = 85$ ft., Ans.

5. $48^2 + 36^2 = 2304 + 1296 = 3600$; $\sqrt{3600} = 60$ mi., Ans.

6. $400^2 - 100^2 = 160000 - 10000 = 150000$

$\sqrt{150000} = 387.30$ ft., Ans.

7. $40^2 + 36^2 = 1600 + 1296 = 2896$

$\sqrt{2896} = 53.81+$ rd., Ans.

8. $32^2 - 25^2 = 1024 - 625 = 399$; $\sqrt{399} = 19.97+$ ft.

$32^2 - 20^2 = 1024 - 400 = 624$; $\sqrt{624} = 24.97+$ ft.

$19.97+$ ft. $+ 24.97+$ ft. $= 44.94+$ ft., Ans.

Article 394.

9. 36 ft. $\times$ 15 ft. $= 540$ sq. ft., Ans.

10. 16 ft. $\times$ 12 ft. $= 192$ sq. ft., Ans.

11. 37 ft. $\times$ 27 ft. $= 999$ sq. ft.; 40 ft. $\times$ 20 ft. $= 800$ sq. ft.

999 sq. ft. $-$ 800 sq. ft. $= 199$ sq. ft., Ans.

Article 396.

12. $\frac{120 + 100}{2} \times 85 = 9350$ sq. ft., Ans.

13. $60^{cm} = 0.6^{m}$; $40^{cm} = 0.4^{m}$; $\frac{0.6^{m} + 0.4^{m}}{2} = 0.5^{m}$

$0.5^{m} \times 6^{m} = 3^{sq\,m}$, Ans.

14. $\frac{131 \text{ yd.} + 243 \text{ yd.}}{2} \times 220 = 41140$ sq. yd.

41140 sq. yd. $= 8\frac{1}{9}$ acres, Ans.

Article 398.

16. $\frac{14 \text{ ft.} + 18 \text{ ft.}}{2}$, or 16 ft., $\times$ 65 ft., $= 1040$ sq. ft., Ans.

17. $\frac{58\frac{1}{2} \text{ ft.} + 65\frac{3}{4} \text{ ft.}}{2}$, or $62\frac{1}{8}$ ft., $\times$ $126\frac{1}{4}$ ft. $= 7843\frac{9}{32}$ sq. ft.

$7843\frac{9}{32}$ sq. ft. $\div 9 = 871\frac{137}{288}$ sq. yd., Ans.

Article 400.

18. $15 \times 6 = 90$ cu. ft., Ans.

19. $6^{m} = 600^{cm}$; $18 \times 20 \times 600 = 216000^{cu\,cm}$, Ans.

20. 20 ft. 6 in. $= 246$ in.; $1075.30 \times 246 = 264523.8$ cu. in. $= 153\frac{233}{288}$ cu. ft., Ans.

Article 403.

21. 14 ft. 3 in. $= 14.25$ ft.; $14.70 \times \frac{14.25}{3} = 69.825$ cu. ft., Ans.

22. $12.5^{m} \div 3.1416 = 3.979^{m}$, diameter of base.

$\frac{3.979}{2} \times \frac{12.5}{2} = 12.434375$, area of base.

$12.434375 \times \frac{15.06}{3} = 62.42+^{cu\,m}$, Ans.

23. $693^{2} = 480249$ sq. ft., area of base.

$480249 \times \frac{500}{3} = 80041500$ cu. ft., Ans.

Article 405.

25. $3 \times 3.1416 = 9.4248$ ft., circumference of larger end.

$\frac{9.4248}{2} \times \frac{3}{2} = 7.0686$ ft., area of base.

$2.5 \times 3.1416 = 7.854$ ft., circumference of smaller end.

$\frac{7.854}{2} \times \frac{2.5}{2} = 4.90875$, area of base.

$7.0686 \times 4.90875 = 34.69799025$

$\sqrt{34.69799025} = 5.8905$

$7.0686 + 4.90875 + 5.8905 = 17.86785$

$17.86785 \times \frac{28.5}{3} = 169.744575$ cu. ft., Ans.

26. 27 in. $= \frac{9}{4}$ ft.; $\frac{9}{4} \times \frac{9}{4} = \frac{81}{16}$; 16 in. $= \frac{4}{3}$ ft.; $\frac{4}{3} \times \frac{4}{3} = \frac{16}{9}$

$\frac{\overset{9}{\cancel{81}}}{\underset{}{\cancel{16}}} \times \frac{\cancel{16}}{\cancel{9}} = 9$; $\sqrt{9} = 3$; $\frac{81}{16} + \frac{16}{9} + 3 = \frac{1417}{144}$

18 ft. 8 in. $= \frac{56}{3}$ ft.; $\frac{56}{3}$ ft. $\div 3 = \frac{56}{9}$ ft.

$$\frac{1417}{\underset{18}{\cancel{144}}} \times \frac{\overset{7}{\cancel{56}}}{9} = \frac{9919}{162} = 61\tfrac{37}{162} \text{ cu. ft., Ans.}$$

Article 407.

27. 25^2, or 625, $\times 3.1416 = 1963.5$ sq. in., Ans.

28. 18^2, or 324, $\times 3.1416 = 1017.8784$ sq cm

1017.8784 sq cm $\div 10000 = 0.101787+$ sq m, Ans.

29. $50^3 = 125000$; $125000 \times \frac{3.1416}{6} = 65450$ cu. ft., Ans.

30. $2100^3 = 9261000000$

$9261000000 \times \frac{3.1416}{6} = 4849059600$ cu. mi., Ans.

Article 409.

32. $12^2 : 8^2 = 72 : x$ $\quad \frac{\overset{32}{\cancel{64} \times \cancel{72}}}{\underset{2}{\cancel{144}}} = 32$ sq. ft., Ans.

33. $9 : 6.25 = 120^2 : x^2$ $\quad \frac{\overset{1600}{\cancel{14400} \times 6.25}}{\cancel{9}} = 10000$

$\sqrt{10000} = 100$ rd., Ans.

34. 100 rd. $\times$ 3.1416 = 314.16, circumference of larger circle.

$\frac{314.16 \times \overset{25}{\cancel{100}}}{\cancel{2} \times \cancel{2}} = 7854$ sq. ft., area of larger circle.

$100^2 : 50^2 = 7854 : x$

$\frac{\cancel{2500} \times 7854}{\underset{4}{\cancel{10000}}} = 1963.5$ sq. ft., area of smaller circle.

7854 sq. ft. $-$ 1963.5 sq. ft. = 5890.5 sq. ft., Ans.

35. $35^2 : 1.5^2 = 5 : x$ $\quad \frac{2.25 \times \cancel{5}}{\underset{245}{\cancel{1225}}} = \frac{9}{980}$ hours, Ans.

36. $16^2 : 24^2 = \$30 : x$ $\quad \frac{\overset{9}{\cancel{576} \times 30}}{\underset{4}{\cancel{256}}} = \$67.50$, Ans.

37. $15^2 : 45^2 = 105.55 : x$ $\quad \dfrac{\overset{9}{\cancel{2025}} \times 105.55}{\cancel{225}} = 949.95^{\text{sq m}}$, Ans.

Article 412.

39. $400 : 600 = 4^3 : x^3$ $\quad \dfrac{\overset{6}{\cancel{600}} \times \overset{16}{\cancel{64}}}{\cancel{400}} = 96$

$\sqrt[3]{96} = 4.57+$ ft., Ans.

40. $16 : 8 = 12^3 : x^3$ $\quad \dfrac{8 \times \overset{108}{\cancel{1728}}}{\cancel{16}} = 864$; $\sqrt[3]{864} = 9.5+$ in.

12 in. $-$ 9.5 in. $=$ 2.5 in., Ans.

41. $6^3 : 12^3 = 16.50 : x$ $\quad \dfrac{\overset{8}{\cancel{1728}} \times 16.50}{\cancel{216}} = 132^{\text{K}}$, Ans.

42. $2000^3 : 8000^3 = 1 : x$ $\quad \dfrac{\overset{64}{\cancel{512}} \times 1}{\cancel{8}} = 64$, Ans.

43. $(5\frac{1}{2})^3 : (8\frac{1}{2})^3 = 140 : x$ $\quad \dfrac{\cancel{8}}{\cancel{1331}} \times \dfrac{\overset{27}{\cancel{35937}}}{\cancel{64}} \times \overset{35}{\cancel{140}} = 472\frac{1}{2}$ lb., Ans.

$\overset{8}{2}$

Article 413.

49. \$ 1 $\times$ 1.10 $=$ \$ 1.10.

\$ 7700 $\div$ \$ 1.10 $=$ \$ 7000, present worth of \$ 7700.

\$ 7000 $-$ \$ 7000 $=$ 0. Hence they do not differ, Ans

50. $\$0.32 - \$0.28 = \$0.04$, loss.

$\frac{4}{32} = \frac{1}{8}$; $\frac{1}{8}$ of $100\% = 12\frac{1}{2}\%$, loss, Ans.

51. $100\% - 10\% = 90\%$.

90% of $\$40 = \$36$, what the suit is sold for.

$100\% + 25\% = 125\%$; $\$36 = 125\%$.

$\frac{\$36}{125} \times \frac{4}{100} = \$28.80$, cost of the suit, Ans.

52. $\sqrt[3]{\frac{27}{64}} = \frac{3}{4}$; $\left(\frac{3}{4}\right)^2 = \frac{9}{16}$; $33\frac{1}{3}\% = \frac{1}{3}$; $\frac{1}{3}$ of $\frac{9}{16} = \frac{3}{16}$, Ans.

53. $(14 \text{ ft.})^2 = 196$ sq. ft. on 1 face.

196 sq. ft. $\times 6 = 1176$ sq. ft. = surface of 6 faces, Ans.

54. $38 - 13 = 25$ States, increase; $\frac{25}{13}$ of $100\% = 192\frac{4}{13}\%$, Ans.

55. $16\frac{2}{3}\% + 20\% = 36\frac{2}{3}\%$; $100\% - 36\frac{2}{3}\% = 63\frac{1}{3}\%$.

$\$5700 = 63\frac{1}{3}\%$; $\frac{\$5700}{63\frac{1}{3}} \times 100 = \$9000$, Ans.

56. $100\% - 20\% = 80\%$.

80% of $\$0.80 = \$0.64$, cost of the books.

15% of $\$1 = \$0.15$; $\$1.00 - \$0.15 = \$0.85$.

5% of $\$0.85 = \$0.04\frac{1}{4}$.

$\$0.85 - \$0.04\frac{1}{4} = \$0.80\frac{3}{4}$, selling price.

$\$0.80\frac{3}{4} - \$0.64 = \$0.16\frac{3}{4}$, gain, Ans.

57. $\$8.50 \times 2000 = \$17000$, received for flour.

$1\frac{1}{2}\%$ of $\$17000 = \$255$, commission.

$\$255 + \$74 + \$27 = \$356$.

$\$17000 - \$356 = \$16644$, Ans.

58. $62.40 \div .00\frac{1}{4} = \$24960 = \frac{3}{4}$ of value of house.

$\frac{\$24960}{3} \times 4 = \$33280$, value of the house.

$\$24960 - \$33280 = \$8320.$

$\$8320 + \$62.40 = \$8382.40$, Ans.

59. $\$25375 = 101\frac{1}{2}\%$ of the purchase money.

$\frac{\$25375}{101\frac{1}{2}} \times 100 = \$25000$, with which to buy cotton.

$\$25000 \div \$0.12\frac{1}{2} = 200000$ lb., Ans.

60. The annual income of a share of 6% stock is $6.

If the cost is $112, the income is $\frac{6}{112}$, or $\frac{3}{56}$ of the cost.

$\frac{3}{56}$ of $100\% = 5\frac{5}{14}\%$ of the cost, Ans.

61. From May 30, 1894, to Dec. 24, 1897, = 3 y. 6 mo. 24 d.

$2)\ \$892$ = Principal.

4.46 = 1 month's interest.

$42\frac{4}{5}$ = Time in months.

892

1784

3568

$\$190.888$ = Interest at 6%.

47.722 = " " $1\frac{1}{2}\%$.

$\$143.166$ = " " $4\frac{1}{2}\%$.

892.

Ans. $\$1035.166$, Amount.

62. $600 = 120% of cost of 1st piano.

$\frac{\$600}{120} \times 100 = \$500$, cost of 1st piano.

$600 = 80% of cost of 2d piano.

$\frac{\$600}{80} \times 100 = \$750$, cost of 2d piano.

$600 + $600 = $1200, what was received for both.

$500 + $750 = $1250, cost of both.

$1250 − $1200 = $50, loss, Ans.

63.

Principal for 1st 6 mo.	$1200.00
Interest " "	24.00
Principal for 2d 6 mo.	$1224.00
Interest " "	24.48
Principal for 3d 6 mo.	$1248.48
Interest " "	24.97
Principal for 3 mo. 18 d.	$1273.45
Interest " " "	15.28
Compound amount for 1 y. 9 mo. 18 d. .	$1288.73
Given principal	1200.00
Compound interest . . . . . Ans.	$88.73

64. $1 × .08 × $\frac{3}{4}$ = $0.06, int. of $1 for 9 mo. at 8%.

$1 + $0.06 = $1.06, amount of $1 for 9 mo.

$1500 ÷ $1.06 = $1415.094, present worth.

$1500 − $1415.094 = $84.906, discount, Ans.

65. $1000 × .07 = $70, int. of $1000 for 1 year.

$1500 − $1000 = $500, interest.

$500 ÷ $70 = 7$\frac{1}{7}$. Ans. 7$\frac{1}{7}$ years.

66.

Principal	$1600.00
Int. from Jan. 1, 1889, to July 10, 1889, 6 m. 9 d.	50.40
Amount	$1650.40
1st payment	200.00
New principal	$1450.40
Int. from July 10, 1889, to Aug. 15, 1890, 1y. 1m. 5d.	95.48
Amount	$1545.88
2d payment	200.00
New principal	$1345.88
Int. from Aug. 15, 1890, to May 12, 1891, 8m. 27d.	59.89
Amount	$1405.77
3d payment	200.00
New principal	$1205.77
Int. from May 12, 1891, to Jan. 1, 1892, 7 m. 20 d.	46.22
Amount due Jan. 1, 1892 . . . . . Ans.	$1251.99

67. $1.87½ × 62¾ = $117.66.
15% of $117.66 = $17.65, discount.
$117.66 − $17.65 = $100.01, Ans.

68.

½% of $8000 = $40, paid for insurance.
$8000 + $40 + $64 + $1260 = $9364, whole cost.
Int. of $11000 for 2 mo. 3 d. at 5% = $96.25, bank discount.
$11000 − $96.25 = $10903.75, proceeds of the note.
$10903.75 − $9364 = $1539.75, gain, Ans.

69. Bank discount of $1 for 4 mo. 3 d. at 4% = $0.013⅓.
Proceeds of $1 = $1 − $0.013⅓ = $0.986⅓.
$800 ÷ 0.986⅓ = 811.08\frac{14}{15}\frac{28}{75}$, face of the note, Ans.

70. $143½ + $¼ = $143¾, cost of 1 share.
$143¾ × 125 = $17968¾, Ans.

71. 93 d. after April 10, 1892 = July 12, day of maturity.
From May 14 to July 12 = 59 d., term of discount.
Int. of \$ 1292 for 59 d. at 6% = \$ $12.70\frac{7}{15}$, bank discount.
\$ 1292 − \$ $12.70\frac{7}{15}$ = \$ $1279.29\frac{8}{15}$, proceeds, Ans.

72. \$ 1 of exchange = 5.14 francs.
8500 francs ÷ 5.14 francs = \$ 1653.69+, Ans.

73. $\sqrt{0.0625} : (\frac{1}{2})^2 = x : \sqrt[3]{15.625}$; or $.25 : \frac{1}{4} = x : 2.5$

$$\frac{.25 \times 4 \times 2.5}{1} = 2.5, \text{ Ans.}$$

74. Since the mean proportional between the extremes of a proportion is one of the equal means of the proportion (Art. 346), the mean proportional between two numbers is equal to the square root of their product. Hence,

$$\sqrt{816 \times 97\frac{1}{2}} = \sqrt{79560} = 282.0638+, \text{ Ans.}$$

75. $\frac{3}{4}$ lb. = 12 oz.; 12 oz. : $\frac{3}{5}$ oz. = \$ $\frac{5}{6}$: x

$$\frac{1 \times \cancel{3} \times \cancel{5}}{\cancel{12}_{4} \times \cancel{5} \times 6} = \$\,\frac{1}{24}, \text{ or } \$\,0.04\tfrac{1}{6}, \text{ Ans.}$$

76. $\left.\begin{matrix} 8 : 12 \\ 10 : 8.50 \end{matrix}\right\} = 10 \text{ oz.} : x$

$$\frac{\overset{3}{\cancel{12}} \times \overset{4.25}{\cancel{8.50}} \times \cancel{10}}{\cancel{8} \times \cancel{10}_{\cancel{2}}} = 12.75 \text{ oz., Ans.}$$

77. $\left.\begin{matrix} 31 : 28 \\ 4 : 3 \\ 3\frac{1}{2} : 4\frac{1}{3} \end{matrix}\right\} = \$\,4 : x$

$$\frac{\overset{4}{\cancel{28}} \times \cancel{3} \times 13 \times \cancel{4} \times 2}{\cancel{4} \times \cancel{3} \times 31 \times \cancel{7}} = \frac{104}{31} = \$\,3\tfrac{11}{31}, \text{ or } \$\,3.35\tfrac{4}{31}, \text{ Ans.}$$

78. $14 + 12 + 7 = 33$

$\frac{14}{33}$ of \$ 7000 = \$ 2969.69$\frac{21}{33}$, 1st child's share.

$\frac{12}{33}$ of \$ 7000 = \$ 2545.45$\frac{15}{33}$, 2d " "

$\frac{7}{33}$ of \$ 7000 = \$ 1484.84$\frac{28}{33}$, 3d " "

79. Ames's \$ 8000 for 12 mo. = \$ 96000 for 1 mo.
Stevens's \$ 6000 " 12 " = \$ 72000 "
Conant's \$ 5000 " 8 " = \$ 40000 "
Hubbell's \$ 3000 " 5 " = \$ 15000 "
The entire stock = \$ 223000 "

$\frac{96000}{223000} = \frac{96}{223}$; $\frac{96}{223}$ of \$ 12000 = \$ 5165.91$\frac{207}{223}$, Ames's share.

$\frac{72000}{223000} = \frac{72}{223}$; $\frac{72}{223}$ of \$ 12000 = \$ 3874.43$\frac{211}{223}$, Stevens's "

$\frac{40000}{223000} = \frac{40}{223}$; $\frac{40}{223}$ of \$ 12000 = \$ 2152.46$\frac{142}{223}$, Conant's "

$\frac{15000}{223000} = \frac{15}{223}$; $\frac{15}{223}$ of \$ 12000 = \$ 807.17$\frac{103}{223}$, Hubbell's "

80.

120 rd. $\times$ 80 rd. = 9600 sq. rd., area of 1st lot.

$\sqrt{9600}$ = 97.979+ rd. on 1 side of square lot.

97.979 rd. $\times$ 4 = 391.916 rd., perimeter of square lot.

(120 + 80), or 200 rd., $\times$ 2 = 400 rd., perimeter of rectangular lot.

$$400 : 391.916 = \$ 320 : x$$

$$\frac{391.916 \times 320}{400} = \$ 313.532+, \text{ Ans.}$$

81. $90^2 + 90^2 = 8100 + 8100 = 16200$

$\sqrt{16200} = 127.279+$ ft., Ans.

82. A section of land = 1 sq. mi.
1 mi. = 320 rd., length of each side.
$320^2 + 320^2 = 102400 + 102400 = 204800$
$\sqrt{204800} = 452.54+$ rd., Ans.

83. $\sqrt[3]{25934.336} = 29.6$ ft., Ans.

84. 1 quarter-section of land is $\frac{1}{4}$ mile, or 160 rods, square. She would walk the number of rods on three sides of the square, plus the diagonal of the square.

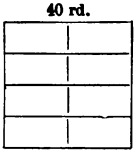
160 rd. $\times$ 3 = 480 rd.
$160^2 + 160^2 = 25600 + 25600 = 51200$
$\sqrt{51200} = 226.274$ rd., diagonal.
480 rd. + 226.274 rd. = 706.274 rd.
706.274 rd. = 2 mi. 66.274 rd., Ans.

85. 32 $\times$ 128 cu. ft. = 4096 cu. ft.; $\sqrt[3]{4096} = 16$ ft., Ans.

86. $60^2 + 40^2 = 3600 + 1600 = 5200$
$\sqrt{5200} = 72.11+$ in., diagonal of 1 side.
$(72.11+)^2 + 20^2 = 5200 + 400 = 5600$
$\sqrt{5600} = 74.833+$ in., Ans.

87. 1 acre = 43560 sq. ft.; $\sqrt{43560} = 208.71+$ ft., Ans.

88. 10 $\times$ 160 sq. rd. = 1600 sq. rd.
$\sqrt{1600} = 40$ rd., length of each side.
Eight sections of fence, each 40 rd. long, will be required.



40 rd. $\times$ 8 = 320 rd.
\$ 0.75 $\times$ 320 = \$ 240, Ans.

If the field is divided into 8 lots, each 5 rods wide and 40 rods long, 11 sections of fence, each 40 rods long, will be required.

11 $\times$ 40 $\times$ \$ 0.75 = \$ 330, Ans.

89. $40^2 - 12^2 = 1600 - 144 = 1456$

$\sqrt{1456} = 38.157+$ ft., Ans.

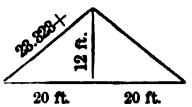
90. $\sqrt{175616} = 56$ in., length of 1 face.

$56^2 + 56^2 = 3136 + 3136 = 6272$

$\sqrt{6272} = 79.195+$ in., Ans.

91. $\sqrt{5184} = 72$, the number. $72^2 = 373248$, Ans.

92.



$20^2 + 12^2 = 400 + 144 = 544$

$\sqrt{544} = 23.323+$ ft., Ans.

93. $\sqrt{2\frac{7}{9}} = \frac{\sqrt{25}}{\sqrt{9}} = \frac{5}{3}$; $\sqrt[3]{4\frac{17}{27}} = \frac{\sqrt[3]{125}}{\sqrt[3]{27}} = \frac{5}{3}$

$\frac{5}{3} \div \frac{5}{3} = 1$, Ans.

94. $\sqrt[3]{592704} = 84$ in., length of 1 face.

$84^2 = 7056$ sq. in., area of 1 face.

7056 sq. in. $\times$ 6 = 42336 sq. in., area of 6 faces, Ans.

95. $300 \times 2 = 600$ pairs; $\frac{1}{3}$ of 6 days = 3 days.

$\left.\begin{matrix} 300 : 600 \\ 3 : 6 \end{matrix}\right\} = 8 : x$ $\quad \frac{\overset{2}{\cancel{600}} \times \overset{2}{\cancel{6}} \times 8}{\underset{1}{\cancel{300}} \times \underset{1}{\cancel{3}}} = 32$ men.

32 men $-$ 8 men = 24 men, Ans.

96. $6 : 11 = x : 16\frac{7}{9}$ $\quad \frac{\overset{76}{\cancel{6}} \times \cancel{83\frac{6}{9}}}{11 \times 5} = \frac{456}{5} = 91\frac{1}{5}$, Ans.

97. $\frac{3}{12} : \frac{5}{8} = \frac{6}{24} : \frac{15}{24} = 6 : 15$, or $2 : 5$, Ans.

98. $4\frac{5}{16} : 11\frac{3}{8} = \$1.38 : x$ $\quad \frac{\overset{2}{\cancel{16}} \times 91 \times \overset{.02}{\cancel{1.38}}}{\cancel{69} \times \cancel{8}} = \$3.64$, Ans.

99. $8 : 24 = 24 : x$ $\quad \frac{\overset{3}{\cancel{24}} \times 24}{\cancel{8}} = 72$ men, Ans.

100. A's \$2000 for 12 mo. = \$24000 for 1 mo.

\$24000 for 1 mo. $= \frac{\$24000}{9}$, or $\$2666\frac{2}{3}$ for 9 mo., what B put in. Ans. $\$2666.66\frac{2}{3}$.

101. 20 mi. $\times$ 5 = 100 mi., A is in advance of B.

25 mi. $-$ 20 mi. = 5 mi., B gains in 1 day.

$100 \div 5 = 20$ days,
25 mi. $\times 20 = 500$ mi., } Ans.

102. The 1st will empty $\frac{1}{2}$, the 2d $\frac{1}{3}$, the 3d $\frac{1}{4}$, in 1 hour.

Together they will empty $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12}$ in 1 hour.

$$\frac{13}{12} : \frac{12}{12} = 1 \text{ h.} : x$$

$\frac{12 \times \cancel{12} \times 1}{13 \times \cancel{12}} = \frac{12}{13}$ h., or 55 min. $23\frac{1}{13}$ sec., Ans.

103. $48 : 36 = 144 : x$ $\quad \frac{36 \times \overset{3}{\cancel{144}}}{\cancel{48}} = 108$ men.

144 men $-$ 108 men = 36 men, Ans.

104. $20 : 15$
$10 : 15$ } $:: 60$ d. $: x$

$$\frac{15 \times \overset{3}{\cancel{15}} \times \overset{3}{\cancel{60}}}{\cancel{20} \times \underset{2}{\cancel{10}}} = \frac{135}{2} = 67\frac{1}{2} \text{ days, Ans.}$$

105. $\$3 + \$5 + \$8 = \$16$.

A's stock $= \frac{3}{16}$; $\frac{3}{16}$ of $\$2000 = \$375$, A receives.

B's " $= \frac{5}{16}$; $\frac{5}{16}$ of $\$2000 = \$625$, B receives.

C's " $= \frac{8}{16}$; $\frac{8}{16}$ of $\$2000 = \$1000$, C receives.

106. $24^2 + 24^2 = 576 + 576 = 1152$

$\sqrt{1152} = 33.941+$ ft. $= 407.29+$ in., Ans.

107. $\sqrt[3]{\frac{9}{8}} = \sqrt[3]{1.125} = 1.04+$, Ans.

$1.\,'125\,'000\ (\ 1.04+$

1

$100^2 \times 3 =$	30000	125000
$100 \times 4 \times 3 =$	1200	
$4^2 =$	16	
	31216	124864

108. 8 ft. 6 in. $= 8.5$ ft. $8.5^2 : x^2 = 1 : 25$

$\frac{72.25 \times 25}{1} = 1806.25$; $\sqrt{1806.25} = 42.5$ ft., Ans.

109. $\left(\frac{7}{8}\right)^2 : \left(\frac{3}{4}\right)^2 = 30$ gal. $: x$; or, $\frac{49}{64} : \frac{9}{16} = 30 : x$

$$\frac{\overset{4}{\cancel{64}} \times 9 \times 30}{49 \times \cancel{16}} = \frac{1080}{49} = 22\tfrac{2}{49}\text{ gal., Ans.}$$

110.

150×6 mo. $=$	900 mo.	
180×8 " $=$	1440 "	
270×4 " $=$	1080 "	
600	3420 "	

$5\frac{7}{10}$ mo., or 5 mo. 21 d., Ans.

111. $2456 + 735 + 436 = 3627$

$\frac{2456}{3627}$ of 182 men $= 123\frac{871}{3627}$, or 123 men, 1st.

$\frac{735}{3627}$ of 182 men $= 36\frac{3188}{3627}$, or 37 men, 2d.

$\frac{436}{3627}$ of 182 men $= 21\frac{3185}{3627}$, or 22 men, 3d.

112. 54 ft. $\div$ 4 = 13.5 ft., length of 1 side of base.

$\frac{13.5}{2}$ ft. $\times$ 100 = 675 sq. ft., area of 1 side.

675 sq. ft. $\times$ 4 = 2700 sq. ft., area of 4 sides.

2700 sq. ft. = 300 sq. yd., Ans.

113.

$4^3 : 12^3 = 1 : x$; or $64 : 1728 = 1 : x$ $\quad \frac{1728 \times 1}{64} = 27$, Ans.

Article 414.

1. Four thousand two hundred thirty-eight minus seven hundred fifty-eight equals one hundred forty-five times twenty-four.

2. $24 \times 325 = 7800$; $\quad 36 \times 245 = 8820$.

$8820 - 7800 = 1020$, Ans.

3. $192 \div 16 = 12$; $\quad 64 \div 16 = 4$; $\quad 12 - 4 = 8$, Ans.

4. $125 \times 9 = 1125$, Ans.

5. $20 - 12 = 8$ marbles; $\quad 8 \div 2 = 4$ marbles, Ans.

6. \$50000 $\div$ 12 = \$4166$\frac{2}{3}$, Ans.

7. $730 - 365 = 365$, Ans.

8. $16 \div 2 = 8$ years; $\frac{8}{2} = 4$ years, Ans.

9. $\frac{(12 \times 9) + 12}{5} = \frac{108 + 12}{5} = 24$, Ans.

10. 31×24 h. $= 744$ hours, Ans.

Article 415.

1. $42 \times 75 = 3150$; $56700 \div 3150 = 18$, Ans.

2. $50000 - 360 = 49640$

$49640 \div 136 = 365$, divisor, Ans.

3. $149184 \div 84 = 1776$, Ans.

4. 32 mi. + 36 mi. = 68 mi.

1224 mi. ÷ 68 mi. = 18 days, Ans.

5. $26402 - 18725 = 7677$, Ans.

6. (1.) As many times as there are units in the multiplier.
(2.) When the *multiplicand* is a concrete number.

7. (1.) $40800 \times 30600 = 1248480000$, Ans.
(2.) Because the multiplicand is an abstract number.

8. \$75 × 8 = \$600, cost of 8 horses.
\$125 × 6 = \$750, " 6 horses.
\$600 + \$750 = \$1350, whole cost.
8 + 6 = 14, number of horses.
\$120 × 14 = \$1680, what they were sold for.

\$1680 − \$1350 = \$330, gain, Ans.

$3102\frac{54}{123}$, Ans.

9. 123) 381600
369
126
123
300
246
54

Proof.
3102, quotient.
123, divisor.
9306
6204
3102
381546
54, remainder.
381600, dividend.

10. $\$26 \times 240 = \$6240$, cost.
$\$6240 - \$2820 = \$3420$.
$3420 \div 180 = 19$ horses, Ans.

Article 416.

1. A figure is a character used to represent a number.
A number is a unit or a collection of units.

2. (1.) Forty thousand ninety and forty-nine thousandths.
(2.) An Integer.

3. By adding together the difference and subtrahend; the sum should equal the minuend.

832, minuend.	679, subtrahend.
679, subtrahend.	153, remainder.
153, remainder.	832, minuend.

4.
3008.7
299.99
8467
44
387.5
6
86784
87
99084.19, Ans.

5. 3008.7 — 299.99 = 2708.71, Ans.

6. 8467 + 44 = 8511, Ans.

7.

387.5	387.5
6	387.5
2325.0, Ans.	387.5
	387.5
	387.5
	387.5
	2325.0, Ans.

8.

$997\frac{45}{87}$, Ans.	*Proof.*
87) 86784	997, quotient.
783	87, divisor.
848	6979
783	7976
654	86739
609	45
45	86784, dividend.

9. $85 + $165 = $250, cost of cow and horse.
$276 — $250 = $26, Ans.

10. $205 × 108 = $22140.
22140 ÷ 75 = 295 horses, and $15 remaining, Ans.

Article 417.

1.
87040
6080
6963200
522240
529203200, Ans.

2. 75 × 128 cu. ft. = 9600 cu. ft., Ans.

3. $3 \times 45 = \$135$, value of the apples.
$2 \times 65 = \$130$, " " potatoes.
$\$135 + \$130 = \$265$, amount of sale.
$\$6 \times 40 = \$240$, value of the flour.

$\$265 - \$240 = \$25$, Ans.

4. $\$38.25 \div 17 = \$2.25$, Ans.

5.
84.61, multiplicand.
27, multiplier.
59227
16922
2284.47, product, Ans.

6. $\$0.16 \times 18 = \$2.88$, value of the eggs.

$\$2.88 \div \$0.12 = 24$ lb., Ans.

7. $814 \times 16 = 13024$; $13024 + 279 = 13303$.
$13303 - 384 = 12919 \div 18 = 717\frac{13}{18}$, Ans.

8.

827	215
215	827
4135	1505
827	430
1654	1720
177805	177805

9. $\$6.50 \times 8 = \$52$, cost of the wood.
$\$21 \times 18 = \$378$, " " hay.
$\$0.90 \times 7 = \$6.30$, " " potatoes.
$\$52 + \$378 + \$6.30 = \$436.30$, whole cost.

$\$436.30 - \$75 = \$361.30$, Ans.

10. $\$1.50 \times 4 = \$6.00$, cost of 4 books.
$\$1.80 \times 3 = \$5.40$, " 3 "
$10 - (4 + 3) = 3$ books.
$\$0.28 \times 3 = \$0.84$, cost of 3 books.

$\$6 + \$5.40 + \$0.84 = \$12.24$, whole cost, Ans.

Article 418.

1. $\dfrac{(125 + 36) \times (125 - 36)}{48} = \dfrac{161 \times 89}{48} = 298\frac{15}{48}$, Ans.

2. $\$32400 + \$8400 = \$40800$, what it was sold for.
$\$40800 \div 360 = \$113\frac{1}{3}$, Ans.

3. $\frac{1}{8}$ of $69543248 = 8692906$.
$\frac{4}{9}$ of $81369 = 36164$.
$8692906 - 36164 = 8656742$, Ans.

4. $\frac{1}{5}$ of 1265 books $= 253$ books.
$\$0.50 \times 253 = \$126.50$.
1265 books $- 253$ books $= 1012$ books.
$\$0.75 \times 1012 = \$759$.
$\$126.50 + \$759 = \$885.50$, Ans.

5. $\$0.24 \times 18 = \$4.32$, cost of steak.
$\$0.36 \times 4\frac{1}{2} = \$1.62$, " eggs.
$\$0.18 \times 3 = \$0.54$, " molasses.
$\$0.75$, " potatoes.
$\$7.23$, Ans.

6. $40 \times 6 = 240$
$35 \times 5 = 175$
$18 \times 4 = 72$

$240 + 175 + 72 + 115 = 602$ people.
$602 - 62 = 540$; $\$0.25 \times 540 = \$135$, Ans.

7. $\$1134.50 - \$55 = \$1079.50$, cost of 254 sheep.
$\$1079.50 \div 254 = \$4.25$, cost of 1 sheep.

$\$4.25 \times 54 = \$229.50$, cost of 54 sheep, Ans.

8. $\$1.00 = 20$ 5-cent pieces.

$\$720 = 720 \times 20 = 14400$, Ans.

9. $\$45 \times 75 = \$3375$, value of sewing-machines.
$\$3375 + \$200 = \$3575$, what was received.

$\$4278 - \$3575 = \$703$, lost, Ans.

10. $\dfrac{\overset{3010}{6010} \times \cancel{60}20 \times \cancel{9}}{\underset{2}{\cancel{18}}} = 18090100$, Ans.

Article 419.

1. $1 + 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 = 198$.

$4 + 6 + 8 + 9 + 10 + 12 + 14 + 15 + 16 + 18 + 20 + 21 + 22 + 24 + 25 + 26 + 27 + 28 + 30 + 32 + 33 + 34 + 35 + 36 + 38 + 39 + 40 = 622$.

$622 - 198 = 424$, Ans.

2. 9, 14, 25, Ans.

3.

$$\frac{6}{25}+\frac{5}{8}+\frac{3}{4}+\frac{2}{5}+\frac{7}{12}=\frac{144}{600}+\frac{375}{600}+\frac{450}{600}+\frac{240}{600}+\frac{350}{600}=$$
$$\frac{1559}{600}=2\tfrac{359}{600}, \text{ Ans.}$$

4. $16)\,96\;\;16)\,112=\frac{6}{7}$; $18)\,126\;\;18)\,198=\frac{7}{11}$; $14)\,182\;\;14)\,196=\frac{13}{14}$;
$97)\,873\;\;97)\,1067=\frac{9}{11}$. Ans. $\frac{6}{7}, \frac{7}{11}, \frac{13}{14}, \frac{9}{11}$.

5. (1.) A fractional unit is one of the equal parts into which a unit of a fraction is divided. (Art. 99.) Thus, one third is the fractional unit of thirds.

(2.) The unit of a fraction is the unit divided. Thus halves, thirds, are understood to be halves and thirds of 1.

6. $4_{325}^{75}+6_{128}^{84}+12_{150}^{25}=4\tfrac{3}{13}+6\tfrac{2}{3}+12\tfrac{1}{6}=$
$\frac{55}{13}+\frac{20}{3}+\frac{73}{6}=\frac{330}{78}+\frac{520}{78}+\frac{949}{78}=\frac{1799}{78}$, or $23\frac{5}{78}$, Ans.

7. (1.) $175\frac{3}{4}=175\frac{9}{12}=174\frac{21}{12}$
$95\frac{4}{6}=\quad\quad 95\frac{10}{12}$
$79\frac{11}{12}$, Ans.

(2.) $45\frac{5}{9}=45\frac{40}{72}=44\frac{112}{72}$
$25\frac{7}{8}=\quad\quad 25\frac{63}{72}$
$19\frac{49}{72}$, Ans.

8. (1.) A fraction is multiplied by an integer either by multiplying its numerator or dividing its denominator by the integer.

(2.) Dividing the denominator when it can be done without a remainder.

(3.) Because it shortens the process.

9. (1.) $175 \times 12 = 2100$

$$\frac{5}{7} \times 12 = \frac{8\frac{4}{7}}{2108\frac{4}{7}}, \text{ Ans.}$$

(2.) $124 \times 6 = 744$

$$124 \times \frac{3}{4} = \frac{93}{837}, \text{ Ans.}$$

(3.) $6\frac{2}{3} \times 12\frac{3}{4} = \frac{\overset{5}{\cancel{20}}}{\cancel{3}} \times \frac{\overset{17}{\cancel{51}}}{\cancel{4}} = 85$, Ans.

10. $\frac{2}{5}$ of $\frac{3}{\cancel{4}_{2}} = \frac{3}{10}$, part of the ship sold, Ans.

$\frac{3}{10}$ is valued at \$ 30000.

$$\frac{\overset{10000}{\cancel{\$\,30000}} \times 10}{\cancel{3}} = \$\,100000, \text{ value of ship, Ans.}$$

Article 420.

1. (1.) A prime number is a number having no other factors than itself and one.

(2.) A composite number is a number having other factors than itself and one.

(3.) A fraction is one or more of the equal parts of a unit.

2. $182 = 2 \times 7 \times 13$
$196 = 2 \times 2 \times 7 \times 7$

$2 \times 7 = 14$, greatest common divisor. Ans.

3. $8 = 2 \times 2 \times 2$
$7 = 1 \times 7$
$10 = 2 \times 5$
$14 = 2 \times 7$

Ans. $2^3 \times 5 \times 7 = 280$, least common multiple.

4.

$13\frac{1}{4} = \frac{53}{4}$

$61\frac{4}{9} = \frac{553}{9}$

$15\frac{11}{13} = \frac{206}{13}$

5.

$75)225 = \frac{3}{5}$; $75)375$

$36)180 = \frac{5}{13}$. $36)468$

Ans. $\frac{3}{5}, \frac{5}{13}$

6. $\frac{1295}{35} = 37$

$\frac{2170}{17} = 127\frac{11}{17}$

$\frac{1000}{73} = 13\frac{51}{73}$

$\frac{8}{9} \times \frac{4}{4} = \frac{32}{36}$

$\frac{6}{8} \times \frac{3}{4} \times 9 = \frac{27}{36}$

$\frac{5}{12} \times \frac{3}{3} = \frac{15}{36}$

$\frac{2}{3} \times \frac{12}{12} = \frac{24}{36}$

Ans. $\frac{32}{36}, \frac{27}{36}, \frac{15}{36}, \frac{24}{36}$.

8. When required to add or subtract them.

9. $48\frac{3}{10}$
$56\frac{3}{4}$
$40\frac{12}{32}$
$45\frac{27}{40}$
189

$\frac{12}{32} = \frac{3}{8}$

$\frac{3}{10} + \frac{3}{4} + \frac{3}{8} + \frac{27}{40} = \frac{12}{40} + \frac{30}{40} + \frac{15}{40} + \frac{27}{40} =$

$\frac{84}{40} = 2\frac{1}{10}$

$2\frac{1}{10}$
$191\frac{1}{10}$, Ans.

10.

$5\frac{3}{4} + 6\frac{1}{2} = 12\frac{1}{4}$; $25\frac{3}{8}$ bu. $- 12\frac{1}{4}$ bu. $= 13\frac{1}{8}$ bu., Ans.

Article 421.

1. $36 = 2 \times 2 \times 3 \times 3$
$108 = 2 \times 2 \times 3 \times 3 \times 3$
$420 = 2 \times 2 \times 3 \times 5 \times 7$

$2^2 \times 3 = 12$, greatest common divisor, Ans.

2. $24 = 2 \times 2 \times 2 \times 3$
$180 = 2 \times 2 \times 3 \times 3 \times 5$
$45 = 3 \times 3 \times 5$
$60 = 2 \times 2 \times 3 \times 5$

$2^3 \times 3^2 \times 5 = 360$, least common multiple, Ans.

3. $12\frac{3}{4}$
$16\frac{2}{3}$
$24\frac{4}{5}$
$40\frac{7}{8}$
92

$\frac{3}{4} + \frac{2}{3} + \frac{4}{5} + \frac{7}{8} =$

$\frac{90}{120} + \frac{80}{120} + \frac{96}{120} + \frac{105}{120} = \frac{371}{120} = 3\frac{11}{120}$

$\frac{3\frac{11}{120}}{95\frac{11}{120}}$, Ans.

4. $84\frac{1}{3} = 84\frac{8}{24} = 83\frac{32}{24}$
$42\frac{7}{8} = \quad 42\frac{21}{24}$
$41\frac{11}{24}$, Ans.

5. $\frac{2}{3}$ of $12\frac{5}{8} \times 36\frac{2}{5} = \frac{2}{3}$ of $\frac{101}{8} \times \frac{182}{5} = \frac{9191}{30} = 306\frac{11}{30}$, Ans.

$\frac{91}{4}$
2

6. $27\frac{3}{4} = \frac{111}{4}$; $\frac{2}{3}$ of $8\frac{1}{2} = \frac{2}{3}$ of $\frac{17}{2} = \frac{17}{3}$.

$$\frac{111}{4} \div \frac{17}{3} = \frac{111}{4} \times \frac{3}{17} = \frac{333}{68} = 4\frac{61}{68}, \text{ Ans.}$$

7. $\frac{\frac{7}{12}}{\frac{5}{8}} = \frac{7}{\cancel{12}_{3}} \times \frac{\overset{2}{\cancel{8}}}{5} = \frac{14}{15}$, Ans. $\quad \frac{6\frac{3}{4}}{9\frac{3}{5}} = \frac{27}{4} \times \frac{3}{29} = \frac{81}{116}$, Ans.

8. $\frac{\$7000}{2} \times 3 = \$10500$, value of the farm.

$$\frac{5}{8} \text{ of } \$10500 = \$6562\tfrac{1}{2}, \text{ Ans.}$$

9. $240 \div 5\frac{3}{4} = 240 \times \frac{4}{23} = \frac{960}{23}$ mi., what he travels in 1 d.

$$\frac{960}{23} \times 3\tfrac{1}{2} = \frac{\overset{480}{\cancel{960}}}{23} \times \frac{7}{\cancel{2}} = \frac{3360}{23} = 146\tfrac{2}{23} \text{ mi., Ans}$$

10. $\frac{\overset{40}{\cancel{\$120}}}{\cancel{3}} \times 7 = \$280$, value of the coal.

$$\$280 \div \$6 = 46\tfrac{2}{3} \text{ tons, Ans.}$$

Article 422.

1. (1.) Factoring is the process of finding the factors of composite numbers.

(2.) The terms of a fraction are its *denominator*, which shows into how many equal parts the unit is divided; and its *numerator*, which shows how many of the equal parts of the unit are taken.

2. Two or more numbers are said to be prime to each other when they have no common factor.

3. $\dfrac{\overset{5}{\cancel{800}} \times \overset{6}{\cancel{378}} \times \overset{\cancel{11}}{\cancel{44}} \times 15}{\cancel{160} \times \cancel{63} \times \cancel{11} \times \cancel{4}} = 450$, Ans.

4. $135 \div 9 = 15;\ \dfrac{4 \times 15}{9 \times 15} = \dfrac{60}{135}$, Ans.

5. $36\frac{3}{7} = 36\frac{9}{21} = 35\frac{30}{21}$
$15\frac{2}{3} = \qquad 15\frac{14}{21}$
$\qquad\qquad 20\frac{16}{21}$, Ans.

6. $\dfrac{3}{4}$ of $17 = \dfrac{51}{4};\quad 12\frac{4}{9} \div \dfrac{51}{4} = \dfrac{112}{9} \times \dfrac{4}{51} = \dfrac{448}{459}$, Ans.

7.

$\dfrac{2}{3}$ of $\dfrac{5}{7} = \dfrac{10}{21};\ \dfrac{10}{21} = \$45000;\ \dfrac{\$45000}{10} \times 21 = \$94500$, Ans.

8. $\dfrac{\overset{800}{\cancel{4000}}}{\cancel{5}} \times 8 = \$6400$, value of the farm.

$\dfrac{3}{4}$ of $\$6400 = \$4800$, Ans.

9. $\dfrac{\dfrac{7}{8} \times \dfrac{2}{3}}{4\frac{1}{2} \div \dfrac{1}{3}} = \dfrac{\dfrac{14}{24}}{\dfrac{27}{2}} = \dfrac{\overset{7}{\cancel{14}}}{\underset{6}{\cancel{24}}} \times \dfrac{\cancel{2}}{27} = \dfrac{7}{162}$, Ans.

10. $1 = \dfrac{247832}{247832};\ \dfrac{247832}{247832} \div \dfrac{3}{247832} = 82610\frac{2}{3};\ \dfrac{3}{247832}$ is a small fraction, since it takes $82610\frac{2}{3}$ times this fraction to equal one.

Article 423.

1. $1001)3003 = \frac{3}{5}$; $29)87 = \frac{3}{5}$; $143)429 = \frac{3}{5}$.
$1001)5005$ 145 715

2. $4\frac{1}{21} + 3\frac{7}{4} + 4\frac{8}{3} + \frac{6}{7} = 11 + \frac{4}{84} + \frac{147}{84} + \frac{224}{84} + \frac{72}{84} =$

$11\frac{447}{84} = 11 + 5\frac{9}{28} = 16\frac{9}{28}$, Ans.

3. $31\frac{4}{5} = 31\frac{28}{35} = 30\frac{63}{35}$
$12\frac{9}{7} = \quad 12\frac{30}{35}$
$18\frac{33}{35}$, Ans.

4. $\$4283\frac{1}{16} = \$4282\frac{17}{16}$
$\$1597\frac{3}{32} = \$1597\frac{6}{32}$
$\$2685\frac{23}{32}$, Ans.

5. $641 \times 5 = 3205$
$641 \times \frac{3}{8} = 240\frac{3}{8}$
$3445\frac{3}{8}$, Ans.

6. $\frac{1}{17}$ of $3\frac{1}{7}$ of $4\frac{1}{4}$ of $63\frac{3}{8}$ of $\frac{31}{35} = \frac{1}{17}$ of $\frac{11}{22}$ of $\frac{17}{4}$ of $\frac{191}{8}$ of $\frac{8}{21}$
7 2 28

$= \frac{2101}{56}$, Ans.

7. $\frac{8\frac{2}{5}}{9\frac{3}{4}} = \frac{42}{5} \times \frac{4}{39} = \frac{56}{65}$; $\frac{56}{65} + 7\frac{1}{2} = \frac{112}{130} + 7\frac{65}{130} = 8\frac{47}{130}$, Ans.
14 8
13

8. $\$2\frac{1}{4} \div 3\frac{1}{2} = \$\frac{9}{4} \times \frac{2}{7} = \$\frac{9}{14}$, cost of 1 lb.
2

$\frac{3}{4}$ of $\$\frac{9}{14} = \$\frac{27}{56}$, cost of $\frac{3}{4}$ lb., Ans.

9. $2\frac{1}{10} \div 5\frac{7}{11} = \frac{21}{10} \times \frac{11}{62} = \frac{231}{620}$, Ans.

10. $10\frac{3}{4} \times 3 = 32\frac{1}{4}$ miles in 1 hour's flight.

$$2\tfrac{1}{2} \times 32\tfrac{1}{4} = \frac{5}{2} \times \frac{129}{4} = \frac{645}{8} = 80\tfrac{5}{8} \text{ miles, Ans.}$$

Article 424.

1. $20\frac{7}{12} = 20\frac{70}{120}$; $12\frac{1}{40}\frac{3}{0} = 12\frac{39}{120}$.

$20\frac{70}{120} + 12\frac{39}{120} = 32\frac{109}{120}$, sum, Ans.

$20\frac{70}{120} - 12\frac{39}{120} = 8\frac{31}{120}$, difference, Ans.

2. (1.) A fraction can be divided by a whole number either by dividing its numerator or multiplying its denominator.

(2.) Dividing the numerator is preferable when it can be done without a remainder, since it shortens the process.

3. $32\frac{4}{5} \times 5\frac{4}{7} = \frac{164}{5} \times \frac{\overset{8}{\cancel{40}}}{7} = \frac{1312}{7} = 187\frac{3}{7}$ miles, Ans.

4. $\$84\frac{7}{9} \div 18\frac{3}{4} = \frac{763}{9} \times \frac{4}{75} = \frac{3052}{675} = \$4\frac{352}{675}$, Ans.

5. $\frac{3}{4} - \frac{5}{7} = \frac{21}{28} - \frac{20}{28} = \frac{1}{28}$

$\frac{1}{28} = \$500$; $\frac{28}{28} = 28 \times \$500 = \$14000$, Ans.

6. $\frac{1}{3}$ of $\frac{5}{8} = \frac{5}{24}$, the part sold.

$\frac{5}{24} = \$12000$; $\frac{\overset{2400}{\cancel{\$12000}}}{5} \times 24 = \$57600$, Ans.

7 $\frac{3}{4}$ of \$ 12000 + \$ 600 = \$ 9000 + \$ 600 = \$ 9600.
\$ 9600 = $\frac{4}{5}$ of B's money.

$$\frac{\$\,9600}{4} \times 5 = \$\,12000, \text{ B's money, Ans.}$$

8. $$\frac{4\frac{2}{3} + 3\frac{1}{2}}{8\frac{3}{4} \times 2\frac{4}{6}} = \frac{\frac{14}{3} + \frac{7}{2}}{\frac{35}{4} \times \frac{17}{6}} = \frac{\frac{49}{6}}{\frac{595}{24}} = \frac{49}{\cancel{6}} \times \frac{\overset{4}{\cancel{24}}}{595} = \frac{196}{595}, \text{ Ans.}$$

9. 100 acres − $37\frac{1}{2}$ acres = $62\frac{1}{2}$ acres.

$\frac{1}{5}$ of $62\frac{1}{2}$ acres = $\frac{1}{\cancel{5}}$ of $\frac{\overset{25}{\cancel{125}}}{2} = 12\frac{1}{2}$ acres.

$62\frac{1}{2}$ acres − $12\frac{1}{2}$ acres = 50 acres, Ans.

10. $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{7}{8} = \frac{7}{24}$, what he sold.

$\frac{7}{24} = \$\,32000$. $\frac{\$\,32000}{7} \times 24 = \$\,109714\frac{2}{7}$, Ans.

Article 425.

1. $46\frac{5}{8}$
$49\frac{7}{16}$
$57\frac{1}{4}$
152
$1\frac{6}{16}$
$153\frac{5}{16}$, Ans.

$$\frac{5}{8} + \frac{7}{16} + \frac{1}{4} = \frac{10}{16} + \frac{7}{16} + \frac{4}{16} = \frac{21}{16} = 1\frac{5}{16}$$

2. $65\frac{22}{35} + 28\frac{4}{7} = 65\frac{22}{35} + 28\frac{20}{35} = 94\frac{12}{35}$, Ans.

3. $56 - 24\frac{7}{30} = 31\frac{23}{30}$; $41\frac{1}{3} + 31\frac{23}{30} = 73\frac{1}{10}$

$73\frac{1}{10} - 41\frac{11}{15} = 31\frac{11}{30}$, Ans.

4. $\frac{4}{5}$ of $156\frac{2}{3} \times \frac{5}{6}$ of \$ 54 $= \frac{4}{\cancel{5}}$ of $\frac{470}{\cancel{3}} \times \frac{\cancel{5}}{\cancel{6}}$ of \$ $\cancel{54}^{9} =$ \$ 5640, Ans.

5. $297\frac{1}{2} \div 33\frac{1}{8} = \frac{\cancel{595}^{85}}{\cancel{2}} \times \frac{\cancel{6}^{3}}{\cancel{203}_{29}} = \frac{255}{29} = 8\frac{23}{29}$, Ans.

6. $2\frac{1}{4} \div \frac{3}{8} = \frac{\cancel{9}^{3}}{\cancel{4}} \times \frac{\cancel{8}^{2}}{\cancel{3}} = 6$ lots, Ans.

7. $\dfrac{\frac{3}{8} \times \frac{11}{21}}{\frac{1}{18} \times 5\frac{1}{2}} = \dfrac{\frac{33}{168}}{\frac{11}{36}} = \dfrac{\cancel{33}^{3}}{\cancel{168}_{14}} \times \dfrac{\cancel{36}^{3}}{\cancel{11}} = \frac{9}{14}$, Ans.

8. $\frac{3}{4}$ of 8 mi. $= 6$ mi.

$$6 \text{ mi.} = \frac{6}{9} \text{ of } 9 \text{ mi.} = \frac{6}{9}, \text{ or } \frac{2}{3}, \text{ Ans.}$$

9. $\dfrac{\$\,9000}{2} \times 3 = \$\,13500$, value of the farm.

$$\frac{5}{12} \text{ of } \$\,13500 = \$\,5625, \text{ Ans.}$$

10. $\dfrac{5+2}{3+2} = \dfrac{7}{5}$; $\dfrac{5}{3} - \dfrac{7}{5} = \dfrac{25}{15} - \dfrac{21}{15} = \dfrac{4}{15}$, diminished, Ans.

Article 426.

1. $7\frac{1}{5} - 3\frac{7}{8} = 3\frac{13}{40}$; $3\frac{13}{40} \div 14\frac{7}{9} = \dfrac{\cancel{133}^{19}}{40} \times \dfrac{9}{\cancel{133}} = \dfrac{9}{40}$, Ans.

2. $\frac{1}{3}$ of a day's work can be had for \$ 1; for \$ $2\frac{1}{2}$ can be had

$$2\tfrac{1}{2} \times \frac{1}{3} = \frac{2\frac{1}{2}}{3} = \frac{5}{2} \times \frac{1}{3} = \frac{5}{6} \text{ day, Ans.}$$

3. $94 \times 26\frac{2}{3} = 2506\frac{2}{3}$; $12000 \div 7\frac{3}{4} = 1548\frac{12}{31}$

$2506\frac{2}{3} - 1548\frac{12}{31} = 958\frac{46}{93}$, Ans.

4. $\frac{4}{63} + \frac{3}{84} = \frac{16}{252} + \frac{9}{252} = \frac{25}{252}$, Ans.

5.

$\frac{1}{2}$ of $\frac{3}{7} = \frac{3}{14}$; $\frac{7}{8} \times 3\frac{1}{5} = \frac{14}{5}$; $\frac{14}{5} + \frac{3}{14} = \frac{211}{70}$, denominator.

$\frac{2}{3}$ of $\frac{211}{70} = \frac{211}{105}$, numerator. $\frac{211}{105} \div \frac{211}{70} = \frac{2}{3}$, Ans.

The value of any fraction whose numerator is $\frac{2}{3}$ of its denominator is $\frac{2}{3}$. The solution is unnecessary.

6. $6\frac{2}{3} \times 2\frac{5}{8} = \frac{\overset{5}{\cancel{20}}}{\underset{2}{\cancel{3}}} \times \frac{\overset{7}{\cancel{21}}}{\underset{2}{\cancel{8}}} = \frac{35}{2}$; $5\frac{1}{3} \div 3\frac{3}{4} = \frac{16}{3} \times \frac{4}{15} = \frac{64}{45}$

$\frac{35}{2} + \frac{64}{45} = \frac{1575}{90} + \frac{128}{90} = 18\frac{83}{90}$, sum.

$\frac{35}{2} - \frac{64}{45} = \frac{1575}{90} - \frac{128}{90} = 16\frac{7}{90}$, difference.

$18\frac{83}{90} + 16\frac{7}{90} = 35$, Ans.

7. $\$2\frac{1}{2} = \frac{5}{2} \div \frac{3}{5} = \frac{25}{6} = \$4\frac{1}{6}$, cost.

$\$4\frac{1}{6} - \$2\frac{1}{2} = \$1\frac{2}{3}$, loss, Ans.

8. $\frac{1}{5}$ of 2 qt., or $\frac{2}{5}$ qt., $+ \frac{1}{3}$ qt. $= \frac{11}{15}$ qt.

2 qt. $- \frac{11}{15}$ qt. $= 1\frac{4}{15}$ qt., remainder.

$1\frac{4}{15}$ qt. $= \frac{19}{15} \div 3 = \frac{19}{45}$ qt., Ans.

9. (1.) $24\frac{3}{4} = \frac{99}{4} \times \frac{7}{8} = \frac{693}{32} = 21\frac{21}{32}$, Ans.

(2.) $24\frac{3}{4} = \frac{99}{4} \div \frac{7}{8} = \frac{99}{\cancel{4}} \times \frac{\overset{2}{\cancel{8}}}{7} = \frac{198}{7} = 28\frac{2}{7}$, Ans.

(3.) $23\frac{2}{7} - 21\frac{21}{32} = 6\frac{11}{224}$, Ans.

10. $\frac{\$1760}{3} \times 8 = \frac{14080}{3} = \$4693\frac{1}{3}$, value of farm.

$\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$; $\frac{1}{2}$ of $\frac{5}{8} = \frac{5}{16}$, B's share.

$\frac{5}{8} - \frac{5}{16} = \frac{5}{16}$, C's share.

$\frac{5}{16}$ of $\$4693\frac{1}{3}$, or $\$1466\frac{2}{3}$, + $\$375 = \$1841\frac{2}{3}$, Ans.

Article 427.

1. $\frac{9}{48} = \frac{9.0000}{48} = .1875$, Ans.

2. .800
.00008
.79992, Ans.

3. Seven and eight thousandths. Nine thousand ninety and nine hundred nine thousandths. Forty-two hundred-thousandths.

4. $0.0025 = \frac{25}{10000} = \frac{1}{400}$, Ans.

5. The denominator of a decimal is not expressed, since it is always 1 with as many ciphers as there are decimal figures.

6. $49\frac{7}{8} = 49.875$; $\frac{1}{2} = .5$; $3\frac{3}{4} = 3.75$

.5 + 3.75 + 21.125 = 25.375 yd., what was sold.

49.875 yd. − 25.375 yd. = 24.5 yd., Ans.

7. $\frac{3}{8} = .375$

$\frac{4}{5} = .8$

$\frac{5}{16} = .3125$

$\frac{9}{75} = .12$

1.6075, Ans.

8. $\$1.37\frac{1}{2} \times 240 = \$330$, Ans.

9. $\$12.56 \div 4 = \$3.14$, cost of 1 bu.

$\$3.14 \times 9 = \$28.26$, Ans.

10. $.024 \div .0025 = 9.6$

$.016 \times 300 = 4.8$

$4.8 \div 9.6 = .5$, Ans.

Article 428.

1. $\frac{73}{8000} = 73 \div 8000 = .009125$, Ans.

2. $.00960 = \frac{960}{100000} = \frac{6}{625}$, Ans.

3. $144 \div 12000 = .012$; $.0144 \div .00012 = 120$

$.012 \times 120 = 1.44$, Ans.

4. .02 of $.006 = .00012$

$.00012 - .0000023 = .0001177$, Ans.

5. $17.28 \div .083\frac{1}{3} = 207.36$, Ans.

6. $.027\frac{1}{2} = .0275$; $.36\frac{3}{4} = .3675$

$.0275 \times .3675 = .01010625$, Ans.

7. $\frac{7\frac{1}{2}}{6000} = \frac{15}{2} \times \frac{1}{\cancel{6000}\ 400} = \frac{1}{800} = .00125$, Ans.

8. (1.) By moving the decimal point three orders to the left.
(2.) By moving the decimal point two orders to the right.

9. $90 \div .03 = 3000$, the number; $3000 \times .005 = 15$, Ans.

10. $1.2 \div .0025 = 480$; $480 - .0025 = 479.9975$, Ans.

Article 429.

1. $\frac{3}{40} = .075$, $\times .0008 = .00006$; $.00006 \div .02 = .003$, Ans.

2. $1000 \div .001 = 1000000$
$1000 \times .001 = 1$, product of dividend and divisor.
$1 + 1000 + .001 = 1001.001$
$1000000 - 1001.001 = 998998.999$, Ans.

3.

$.600 \times .00006 = .000036$; $.000036 \div .02\frac{1}{2} = .00144$, Ans.

4. $\$1 + \$2\frac{1}{2} + \$3 + \$5 + \$10 + \$20 = \$41.50$
$\$41.50 \div \$0.25 = 166$, Ans.

5. 15280 bricks $= 15.280$ M.; $15.280 \times \$40 = \$611.20$, cost.
$350 = .350$ M., worthless; $15.280 - .350 = 14.93$
$\$611.20 \div 14.93 = \$40.93\frac{11}{14}\frac{6}{3}\frac{1}{3}$, Ans.

6. $\$1500 - \$968 = \$532$, what he saves in 1 year.
$\$3724 \div \$532 = 7$ years, Ans.

7. $1 - 0.60 = 0.40$, what he had left.
$.83\frac{1}{3} - .40 = .43\frac{1}{3}$; $\$130 = .43\frac{1}{3}$

$$\frac{\$130}{43\frac{1}{3}} \times 100 = \$300, \text{ Ans.}$$

8. 19375 ft. $= 19.375$ thousand ft.
$\$17.25 \times 19.375 = \$334.21\frac{7}{8}$, Ans.

9.

$21\frac{3}{4}$ yd.	carpeting	@	$1.75	$38.06\frac{1}{4}$
25 "	lining	"	$0.12\frac{1}{2}	$3.12\frac{1}{2}$
$2\frac{7}{8}$ "	silk	"	$2.25	$6.46\frac{7}{8}$
$\frac{3}{4}$ "	velvet	"	$2.87\frac{1}{2}	$2.15\frac{5}{8}$
				$49.81\frac{1}{4}$, Ans.

10. $\$11 \div 4400 = \$0.0025$, cost of 1 ft.
$\frac{1}{4}$ of $\$0.0025 = \$0.0006\frac{1}{4}$.
$\$0.0025 + \$0.0006\frac{1}{4} = \$0.0031\frac{1}{4}$.
4400 ft. $-$ 1500 ft. $=$ 2900 ft.
$\$0.0031\frac{1}{4} \times 2900 = \$9.06\frac{1}{4}$, Ans.

Article 430.

1. $25\frac{5}{16} = 25.3125$; $25.3125 - 15.064 = 10.2485$, Ans.

2. (1.) A complex fraction is a fraction having a fraction in one or both of its terms. (Art. 133.)
(2.) A mixed decimal is an integer and a decimal. (Art. 139.)
(3.) A denominate number is a number composed of units of one or more denominations. (Art. 184.)
(4.) Reduction is changing denominate numbers from one denomination to another without changing their value.

3. (1.) $\frac{16}{22} = 16.00000 \div 22 = 0.72727\frac{3}{11}$, Ans.
(2.) $0.0875 = \frac{875}{10000} = \frac{7}{80}$, Ans.

4. 1 ft. $\div 3 = \frac{1}{3}$ yd.; $2\frac{1}{3}$ yd., or $\frac{7}{3}$ yd., $\div 5\frac{1}{2} = \frac{14}{33}$ rd.
$65\frac{1}{33}$ rd., or $\frac{2159}{33}$, $\div 320 = \frac{2159}{10560} = 0.20445+$ mile, Ans.

5. 0.5473 lb. $=$ .5473 of 12 oz. $=$ 6.5676 oz.
.5676 oz. $=$ .5676 of 20 pwt. $=$ 11.352 pwt.
.352 pwt. $=$ .352 of 24 gr. $=$ 8.448 gr.
Ans. 6 oz. 11 pwt. 8.448 gr.

6. $80 \times 12 \times 4 = 3840$ cu. ft.; 3840 cu. ft. $\div 128 = 30$ cd.
$\$5.50 \times 30 = \$165$, Ans.

7. 45 sq. rd. ÷ 160 = $\frac{9}{32}$ A.; 260 A. + $\frac{9}{32}$ A. = $260\frac{9}{32}$ A.

$\$25.75 \times 260\frac{9}{32} = \$6702.24\frac{7}{32}$, Ans.

8. 1 metric ton = 1000 kilograms.

$16.455 \times 1000 = 16455$ kilograms, Ans.

9. 5 oz., or $\frac{5}{16}$ lb., + 6 lb. = $6\frac{5}{16}$ lb.

$\$0.32 \times 6\frac{5}{16} = \$2.02$, cost of coffee.

$\$3.46 - \$2.02 = \$1.44$, cost of sugar.

$\$1.44 \div \$0.11 = 13\frac{1}{11}$ lb., or 13 lb. $1\frac{5}{11}$ oz., Ans.

10. 1 degree = $69\frac{37}{100}$ miles = $\frac{62137}{900}$ miles.

$\frac{62137}{\cancel{900}} \times \cancel{90} = \frac{62137}{10} = 6213.7$ miles in quadrant.

1 mile = 63360 inches.

$6213.7 \times 63360 = 393700032$ inches.

$393700032 \div 10000000 = 39.37+$ inches, Ans.

Article 431.

1. Oct. 11, 1492, to Oct. 11, 1775, = 283 y.
Oct. 11, 1775, to June 11, 1776, = 8 mo.
June 11, 1776, to July 4, 1776, = 23 d.
Oct. 11, 1492, to July 4, 1776, = 283 y. 8 mo. 23 d., Ans

2. 104 A. 117 sq. rd.
87 78
192 A. 35 sq. rd., area of both farms.
40 40
3) 151 A. 155 sq. rd., remainder.
50 A. 105 sq. rd., Ans.

3. 40 min. $= \frac{40}{60} = \frac{2}{3}$ h.

$24 \div \frac{2}{3} = 36$

16 mi. 25 rd. 12 ft.

36

578 mi. 286 rd. 3 ft., Ans.

4. 5 h. 55 min.

15

88° 45′, Ans.

5. 39 T. 1625 lb. $= 79625$ lb.; $79625 \div 85 = 936\frac{5}{17}$ lb., Ans.

6. 2° 30′ 20″ 71° 0′ 0″

5 12 31 40

12° 31′ 40″ Ans. 58° 28′ 20″, West.

7. (1.) A square is a rectangle with equal sides.

(2.) A rectangle is a plane surface with four straight sides and four right angles.

(3.) A cube is a solid bounded by six equal squares. (Art. 170.)

(4.) A solid is that which has length, breadth, and thickness. (Art. 169.)

8. The year 1880 = 366 days. The year 1881 = 365 days.
365 + 366 = 731 days. 4 min. × 731 = 2924 min.

2924 min. = 2 d. 0 h. 44 min., Ans.

9. 32 ft. × 3.1416 = 100.5312 ft., circumference of field.
100.5312 ft. ÷ 4 = 25.1328 ft., on 1 side of square.
$25.1328^2 = 631.65763584$ sq. ft., area of square field.

631.65763+ sq. ft. = 2.32+ sq. rd., Ans.

10. 24 ft. 6 in. $= 24\frac{1}{2}$ ft.; 20 ft. 9 in. $= 20\frac{3}{4}$ ft.; 8 in. $= \frac{2}{3}$ ft.

$\frac{49}{2} \times \frac{83}{4} \times \frac{2}{3} = \frac{4067}{12} = 338\frac{11}{12}$ cu. ft.

$\frac{11}{12} \times 1728 = 1584$ cu. in. Ans. 338 cu. ft. 1584 cu. in.

Article 432.

1. (14 ft. + 16 ft.) × 2 = 60 ft.
60 × 8 = 480 sq. ft., surface of walls.
$\frac{8}{8} - \frac{1}{8} = \frac{7}{8}$; $\frac{7}{8}$ of 480 sq. ft. = 420 sq. ft.
420 ÷ $1\frac{1}{2}$ = 280 ft., length of paper.
280 ft. = $93\frac{1}{3}$ yd.

$93\frac{1}{3}$ yd. ÷ 8 yd. = $11\frac{2}{3}$ rolls, Ans.

2. $\frac{4}{5}$ of $29\frac{1}{3} = \frac{4}{5}$ of $\frac{88}{3} = \frac{352}{15}$; $2\frac{7}{8} = \frac{23}{8} \times \overset{44}{\frac{352}{15}} = \frac{1012}{15}$

$\frac{3}{11}$ of $8 = \frac{24}{11}$; $4\frac{4}{6} = \frac{29}{6} \times \overset{4}{\frac{24}{11}} = \frac{116}{11}$

$\frac{1012}{15} \div \frac{116}{11} = \overset{253}{\frac{1012}{15}} \times \frac{11}{\underset{29}{116}} = \frac{2783}{435} = 6\frac{173}{435}$, Ans.

3. $\frac{3}{5} \times 12 = \frac{36}{5} = 7\frac{1}{5}$ gross; $\frac{1}{5} \times 12 = \frac{12}{5} = 2\frac{2}{5}$ dozen.

Ans. 7 gross, $2\frac{2}{5}$ dozen.

4.

8 × 4 × 2 = 64 sq. in.; 8 × 2 × 2 = 32 sq. in.
4 × 2 × 2 = 16 sq. in.
64 sq. in. + 32 sq. in. + 16 sq. in. = 112 sq. in., surface of 1 brick.

112 sq. in. × 15 = 1680 sq. in., Ans.

5. May 7 + 275 d. = 24 + 30 + 31 + 31 + 30 + 31 + 30 + 31 + 31 + 6 = 275 d. = Feb. 6, Ans.

6. 1 pt. $\div$ 2 $= \frac{1}{2}$ qt.; $3\frac{1}{2}$ qt. $= \frac{7}{2} \div 4 = \frac{7}{8}$ gal.

17 gal. $+ \frac{7}{8} = 17\frac{7}{8}$ gal. \$0.45 $\times$ $17\frac{7}{8}$ = \$8.04$\frac{3}{8}$, Ans.

7. $\frac{3.75 \times 48.34\frac{1}{2}}{.5\frac{1}{8}} = \frac{181.29375}{.5125} = 353.7\frac{18}{41}$, Ans.

8. 1 mile = 5280 ft.; $\frac{1}{2}$ mile $= \frac{1}{2}$ of 5280 ft. = 2640 ft.

2640 $\times$ 60 = 158400 sq. ft.; 1 A. = 43560 sq. ft.

158400 sq. ft. $\div$ 43560 = $3\frac{7}{11}$ A., Ans.

9. 30000 cu. ft. $\div$ 10 ft. = 3000 sq. ft. = $333\frac{1}{3}$ sq. yd.

\$0.75 $\times$ $333\frac{1}{3}$ = \$250, Ans.

10. 3 in. $= \frac{3}{36} = \frac{1}{12}$ yd.; $\overset{25}{\cancel{300}} \times \frac{1}{\cancel{12}} = 25$ sq. yd., Ans.

Article 433.

1. 8 rd. $= 8 \times 16\frac{1}{2} = 132$ ft.; $132 \times 10 = 1320$ sq. ft.

\$0.60 $\times$ 1320 = \$792, what he sold it for.

\$792 $-$ \$660 = \$132, gain, Ans.

2. 4 qt. $= 4 \div 8 = \frac{1}{2}$ pk.; $3\frac{1}{2}$ pk. $= \frac{7}{2} \div 4 = \frac{7}{8}$ bu.

$7 + \frac{7}{8} = 7\frac{7}{8}$ bu.; \$4.80 $\times$ $7\frac{7}{8}$ = \$37.80, Ans.

3. 30 yd. $\times \frac{3}{4}$ yd. = $22\frac{1}{2}$ sq. yd. = $202\frac{1}{2}$ sq. ft.

$202\frac{1}{2}$ sq. ft. $\div$ 15 $= \frac{\overset{27}{\cancel{405}}}{2} \times \frac{1}{\cancel{15}} = \frac{27}{2} = 13\frac{1}{2}$ ft., Ans.

4. 1 acre = 43560 sq. ft.; $\frac{1}{2}$ acre = $\frac{1}{2}$ of 43560 = 21780 sq. ft.

$0.30 × 21780 = $6534, what ½ was sold for.

$\frac{1}{2}$ of $300 = $150, what ½ was bought for.

$6534 − $150 = $6384, gain, Ans.

5. 0.24 lb. = .24 × 16 oz. = 3.84 oz.

3.84 oz. + 7 oz. = 10.84 oz., Ans.

6. 12750 ft. = 12.75 thousand ft.

$27.50 × 12.75 = $350.625, Ans.

7. 132 × 66 = 8712 sq. ft.; 1 acre = 43560 sq. ft.

$\frac{8712}{43560} = \frac{1}{5}$ acre, Ans.

8. 124 bu. 0 pk. 7 qt. = 3975 qt.; 2 bu. 1 pk. 3 qt. = 75 qt.

3975 ÷ 75 = 53 bags, Ans.

9. 3 P.M. March 1, 1881, = 1881 y. 60 d. 15 h.

1881 y.	60 d.	15 h.
1876	7	9
5 y.	53 d.	6 h.

3 y. = 3 × 365 d. = 1095 d.; 2 l.y. = 2 × 366 d. = 732 d.

1095 d. + 732 d. + 53 d. = 1880 d. Ans. 1880 d. 6 h.

10. 125 ft. × 75 ft. = 9375 sq. ft.

1 A. 46 sq. rd. 18½ sq. yd. = 56250 sq. ft.

56250 ÷ 9375 = 6 lots, Ans.

Article 434.

1. 198 rd. × 150 rd. = 29700 sq. rd., area of farm.
29700 sq. rd. ÷ 160 = $185\frac{5}{8}$ acres.
$\$32 \times 185\frac{5}{8} = \$5940$, Ans.

2. $\frac{(16 \text{ in.} + 9 \text{ in.})}{2} = 12\frac{1}{2}$ in., mean width (Art. 229).
$12\frac{1}{2}$ in. ÷ 12 = $1\frac{1}{24}$ ft.; $12 \times 1\frac{1}{24} = 12\frac{1}{2}$ board ft.
$12\frac{1}{2} \div 1000 = .012\frac{1}{2}$ thousand ft.
$\$30 \times .012\frac{1}{2} = \$0.37\frac{1}{2}$, Ans.

3. 1 acre = 43560 sq. ft.; 6 in. = $\frac{1}{2}$ ft.
$$43560 \times \frac{1}{2} = 21780 \text{ cu. ft., Ans.}$$

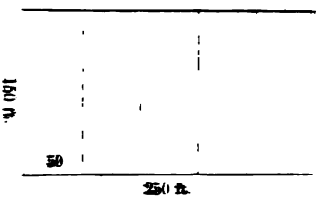
4. $2\frac{1}{4}$ in. ÷ 12 = $\frac{3}{16}$ ft.; $167 \times \frac{3}{16} = \frac{501}{16} = 31\frac{5}{16}$ sq. ft.
$31\frac{5}{16}$ sq. ft. ÷ 9 = $3\frac{2}{4}\frac{3}{8}$ sq. yd., Ans.

5. 1 acre = 43560 sq. ft.; 43560 ÷ 50 = $871\frac{1}{5}$ ft., Ans.

6. $(13 \text{ ft.})^3 = 2197$ cu. ft.; 8 × 4 × 2 = 64 cu. in. in 1 brick.
1728 cu. in. ÷ 64 cu. in. = 27 bricks in 1 cu. ft.
2197 × 27 = 59319 bricks, Ans.

7. 11 min. 11 sec. = $11\frac{11}{60}$ min.
$11\frac{11}{60}$ or $\frac{671}{60} \div 2 = \frac{671}{120}$ min. to sail 1 mile.
$\frac{\overset{993}{\cancel{2979}}}{1} \times \frac{671}{\underset{40}{\cancel{120}}} = \frac{666303}{40}$ min. to sail 2979 miles.
$\frac{666303}{40}$ min. = $\frac{666303}{40} \div 60 = \frac{222101}{800}$ hours.
$\frac{222101}{800}$ h. = $\frac{222101}{800} \div 24 = 11\frac{13}{19}\frac{8}{2}\frac{1}{0}\frac{0}{0}$, days, Ans.

8. 50 ft. × 5 = 250 ft.
250 ft. × 2 = 500 ft.
5 lots will require 6 sections of fence.
150 ft. × 6 = 900 ft.
500 ft. + 900 ft. = 1400 ft. of fence.



1400 × 4 = 5600 bd. ft., Ans.
5600 ÷ 1000 = 5.60 thousand ft.; $16 × 5.60 = $89.60 Ans.

9. $1\frac{1}{2}$ pt., or $\frac{2}{3} \div 2 = \frac{3}{4}$ qt.; $3\frac{3}{4}$ qt., or $\frac{15}{4}, \div 4 = \frac{15}{16}$ gal.

$\frac{15}{16}$ of $240 = $225, actual worth, Ans.

$240 − $225 = $15, gain, Ans.

10. 17 ft. 8 in. $= \frac{53}{3}$ ft.; 8 ft. 3 in. $= \frac{33}{4}$ ft.

$$\frac{53}{\cancel{3}} \times \frac{\overset{11}{\cancel{33}}}{4} \times \frac{2}{\cancel{8}} = 1166 \text{ cu. ft.}; \quad 1166 \text{ cu. ft.} \div 128 = 9\tfrac{7}{64} \text{ cd.}$$

$8.32 × $9\frac{7}{64}$ = $75.79, Ans.

Article 435.

1. 12 × 16½ ft. = 198 ft.; 198 × 110 = 21780 sq. ft.
1 acre = 43560 sq. ft.

$$21780 \text{ sq. ft.} = \frac{21780}{43560} = \frac{1}{2} \text{ acre, Ans.}$$

2. 1 mile = 63360 in.; 63360 ÷ 39.37 = 1609.3 m, Ans

3. 1 cubic meter of water = 1 metric ton.
1 cubic meter of gold = 19.35 metric tons.
1 metric ton = 1000 kilograms.

19.35 × 1000 = 19350 kilograms, Ans.

4. $3 \text{ in.} \div 12 = \frac{1}{4} \text{ ft.}$; $2\frac{1}{4} \text{ ft.} = \frac{9}{4} \div 3 = \frac{3}{4} \text{ yd.}$

$25 \text{ yd.} + \frac{3}{4} \text{ yd.} = 25\frac{3}{4} \text{ yd.}$

$\$0.25 \times 25\frac{3}{4} = \$6.43\frac{3}{4}$, Ans.

5. $.875 \text{ mi.} = .875 \text{ of } 320 \text{ rd.} = 280 \text{ rd.}$

$\$5 \div 2\frac{1}{2} = \$2$, cost of 1 rd.

$\$2 \times 280 = \$560$, Ans.

6. The length of a meter in inches (39.37 in.) multiplied by 10000000 will give the length of a quadrant, or 90°, in inches; $\frac{1}{90}$ of this product will give the length of a degree of latitude in inches, which may be changed to miles by dividing by 63360.

7. $40 \text{ cd.} \times 128 = 5120 \text{ cu. ft.}$; $8 \text{ ft.} \times 4 \text{ ft.} = 32 \text{ sq. ft.}$

$5120 \div 32 = 160 \text{ ft.}$, length of pile, Ans.

8. $(56 + 25)$, or 81 ft., $\times 2 = 162$ ft., length of the four walls.

$162 \times 30 = 4860$ board ft.

$4860 \text{ bd. ft.} \div 1000 = 4.86$ thousand ft.

$\$10 \times 4.86 = \$48.60$, Ans.

9. $8 \text{ ft.} \times 225 \text{ ft.} = 1800 \text{ sq. ft.}$; $10 \text{ ft.} \times 90 \text{ ft.} = 900 \text{ sq. ft.}$

$\$30 \div 900 = \$0.03\frac{1}{3}$, cost of 1 sq. ft.

$\$0.03\frac{1}{3} \times 1800 = \$60$, Ans.

10. $145 \text{ rd.} \div 320 = \frac{145}{320} = \frac{29}{64} \text{ mi.}$

$25 \text{ mi.} + \frac{29}{64} \text{ mi.} = 25\frac{29}{64} \text{ mi.}$

$\$700 \times 25\frac{29}{64} = \$17817.18\frac{3}{4}$, Ans.

Article 436.

1. 14 ft. 9 in. $= 14\frac{3}{4}$ ft.

$16 \times 14\frac{3}{4} = 236$ sq. ft., area of room.

236 sq. ft. $\div 9 = \frac{236}{9}$ sq. yd.

$$\frac{236}{9} \div \frac{3}{4} = \frac{944}{27} = 34\tfrac{26}{27} \text{ yd., Ans.}$$

2. $\frac{1}{4}$ A. $= \frac{43560}{4}$ sq. ft. $= 10890$ sq. ft.

$4\frac{1}{2}$ in. $= \frac{9}{2} \div 12 = \frac{3}{8}$ ft.; $\overset{5445}{\cancel{10890}} \times \frac{3}{\cancel{8}_{4}} = \frac{16335}{4}$ cu. ft.

$$\frac{16335}{4} \div 27 = \frac{16335}{108} = 151\tfrac{1}{4} \text{ cu. yd., Ans.}$$

3. $8\frac{3}{4}$ mi. $+ 10\frac{5}{8}$ mi. $= 19\frac{3}{8}$ mi.; 4 h. 40 min. $= 4\frac{2}{3}$ h.

$19\frac{3}{8} \times 4\frac{2}{3} = \frac{155}{\cancel{8}_{4}} \times \frac{\overset{7}{\cancel{14}}}{3} = \frac{1085}{12} = 90\frac{5}{12}$ mi.

$$120 \text{ mi.} - 90\tfrac{5}{12} \text{ mi.} = 29\tfrac{7}{12} \text{ mi., Ans.}$$

4. 1 mi. $= 5280$ ft.; $5755 = \frac{5755}{5280} = \frac{\overset{307}{\cancel{4605}}}{\cancel{8}} \times \frac{1}{\underset{352}{\cancel{5280}}} = \frac{307}{2816}$

$$\frac{307}{2816} = .109\tfrac{7}{352}, \text{ Ans.}$$

5. $62\frac{1}{2}$ lb. $\times 19.25 = 1203.125$ lb. in 1 cu. ft. of gold.

$1203.125 \times 7000 = 8421875$ gr. troy.

Hence 1 cu. ft. of gold weighs 8421875 gr. troy.

$$8421875 \div 1728 = 4873\tfrac{131}{1728} \text{ gr., Ans.}$$

6. 71200 lb. ÷ 2000 = 35.6 tons.

$22 × 35.6 = $783.20, value of the hay.

19625 ft. ÷ 1000 = 19.625 thousand ft.

$15 × 19.625 = $294.375, value of the boards.

$783.20 − $294.375 = $488.82½, Ans.

7. 40 min. $= \frac{40}{60} = \frac{2}{3}$ h.; 4 h. ÷ $\frac{2}{3}$ h. = 6

16 mi. 25 rd. 12 ft.

6

Ans. 96 mi. 154 rd. 6 ft.

8. 39 T. 16 cwt. 35 lb. = 79635 lb.

79635 lb. ÷ 67 = 1188$\frac{39}{67}$ lb., Ans.

9.

4 h. 44 min.

15

71° 0′, Ans.

10. 18 ft. 8 in. $= 18\frac{2}{3} = \frac{56}{3}$ ft.; 10 ft. 6 in. $= 10\frac{1}{2} = \frac{21}{2}$ ft.

$\frac{\overset{28}{\cancel{56}}}{\cancel{3}} \times \frac{\overset{7}{\cancel{21}}}{\cancel{2}} = 196$ sq. ft.; 196 ÷ 9 = 21$\frac{7}{9}$ sq. yd.

$21\frac{7}{9} \div \frac{3}{4} = \frac{196}{9} \times \frac{4}{3} = \frac{784}{27} = 29\frac{1}{27}$ yd.

$2 × 29$\frac{1}{27}$ = 58.07\frac{11}{27}$, cost of the $2 carpeting.

$21\frac{7}{9} \div 1 = 21\frac{7}{9}$ yd.

$1.75 × 21$\frac{7}{9}$ = 38.11\frac{1}{9}$, cost of the $1.75 carpeting.

58.07\frac{11}{27}$ − 38.11\frac{1}{9}$ = 19.96\frac{8}{27}$

The $2 carpet is 19.96\frac{8}{27}$ more expensive.

Article 437.

1. 24×160 sq. rd. $= 3840$ sq. rd.

3840 sq. rd. $\div 80 = 48$ rd., Ans.

2. 25 rd. square $= 25 \times 25 = 625$ sq. rd.

625 sq. rd. $- 25$ sq. rd. $= 600$ sq. rd., Ans.

3. $50 \times 20 \times 12 = 12000$ cu. ft.

58.5 lb. $\times 12000 = 702000$ lb.

702000 lb. $\div 2000 = 351$ T., Ans.

4. 15° of longitude = 1 hour of time.

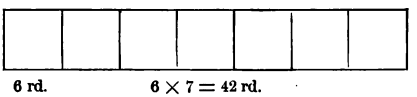
Hence, $15\,)\,4^\circ\ 40'$

Ans. 0 h. 18 min. 40 sec.

5. 5 T. 9 cwt. 75 lb. $= 175600$ oz.

$\$0.01 \times 175600 = \$1756$, Ans.

6. 7 lots will require 8 sections of fence each 6 rd. long, and two sections each 42 rd.



6 rd. $\times 8 = 48$ rd.; 42 rd. $\times 2 = 84$ rd.

48 rd. $+ 84$ rd. $= 132$ rd. of fence.

$\$2.37\frac{1}{2} \times 132 = \$313.50$, Ans.

7. $12 \times 8 \times 6 = 576$ cu. ft.; 576 cu. ft. $\div 128 = 4\frac{1}{2}$ cd.

$\$4.50 \times 4\frac{1}{2} = \$20.25$, Ans.

8. 7 mi. 190 rd. $= 40095$ ft.

$$\frac{25000}{40095} = \frac{5000}{8019} = .6235\tfrac{1535}{8019}, \text{ Ans.}$$

9. 2436 lb. + 2150 lb. + 1735 lb. + 3462 lb. = 9783 lb.

9783 lb. ÷ 2000 = 4.8915 tons.

$\$5.25 \times 4.8915 = \$25.68\frac{3}{20}$, Ans.

10 15 in. $= \frac{15}{12} = \frac{5}{4}$ ft.

100 ft. + 75 ft. = 175 ft., length of walk.

$175 \times \overset{2}{\cancel{8}} \times \frac{5}{\cancel{4}} = 1750$ cu. ft.

$8 \times \overset{2}{\cancel{8}} \times \frac{5}{\cancel{4}} = 80$ cu. ft. in corner.

1750 cu. ft. + 80 cu. ft. = 1830 cu. ft., Ans.

Article 438.

1. $6\frac{1}{4}\% = \frac{6\frac{1}{4}}{100} = \frac{\cancel{25}}{4} \times \frac{1}{\cancel{100}_{4}} = \frac{1}{16}$.

$12\frac{1}{2}\% = \frac{12\frac{1}{2}}{100} = \frac{\cancel{25}}{2} \times \frac{1}{\cancel{100}_{4}} = \frac{1}{8}$.

$8\frac{1}{3}\% = \frac{8\frac{1}{3}}{100} = \frac{\cancel{25}}{3} \times \frac{1}{\cancel{100}_{4}} = \frac{1}{12}$.

$16\frac{2}{3}\% = \frac{16\frac{2}{3}}{100} = \frac{\cancel{50}}{3} \times \frac{1}{\cancel{100}_{2}} = \frac{1}{6}$.

$66\frac{2}{3}\% = \frac{66\frac{2}{3}}{100} = \frac{\overset{2}{\cancel{200}}}{3} \times \frac{1}{\cancel{100}} = \frac{2}{3}$.

2. $\frac{7}{50} = \frac{7}{\cancel{50}_{25}} \text{ of } \overset{2}{\cancel{100}}\% = 14\%$; $\frac{11}{25} = \frac{11}{\cancel{25}_{1}} \text{ of } \overset{4}{\cancel{100}}\% = 44\%$.

$\frac{2}{5} = \frac{2}{\cancel{5}_{1}} \text{ of } \overset{20}{\cancel{100}}\% = 40\%$; $\frac{7}{8} = \frac{7}{8} \text{ of } 100\% = 87\frac{1}{2}\%$.

$\frac{3}{5} = \frac{3}{\cancel{5}_{1}} \text{ of } \overset{20}{\cancel{100}}\% = 60\%$; $\frac{5}{7} = \frac{5}{7} \text{ of } 100\% = 71\frac{3}{7}\%$.

$\frac{25}{40} = \frac{25}{\cancel{40}_{2}} \text{ of } \overset{5}{\cancel{100}}\% = 62\frac{1}{2}\%$.

3.

(1.) Percentage treats of computing in hundredths. (Art. 235.)

(2.) The base is the number of which the hundredths are taken. (Art. 237.)

(3.) The rate per cent is the number of hundredths. (Art. 236.)

4. $75\% \text{ of } 60\% = .45 = \frac{45}{100} = \frac{9}{20}$, Ans.

5. $87\frac{1}{2}\% \text{ of } \$5000 = \$5000 \times .87\frac{1}{2} = \$4375$.

$0.87\frac{1}{2}\% \text{ of } \$5000 = \$5000 \times .0087\frac{1}{2} = \$43.75$.

$\$4375 - \$43.75 = \$4331.25$, Ans.

6. $37\frac{1}{2}\% = \frac{3}{8}$; $\frac{3}{8} \text{ of } 24 \text{ h.} = 9 \text{ h.}$; $1 \text{ h.} = 15°$ of longitude.

$9 \text{ h.} = 9 \times 15° = 135°$, Ans.

7. $33\frac{1}{3}\% = \frac{1}{3}$; $\frac{1}{3} \text{ of } \frac{1}{3} = \frac{1}{9}$; $25\% = \frac{1}{4}$; $\frac{1}{4} \text{ of } \frac{1}{4} = \frac{1}{16}$.

$\frac{1}{9} - \frac{1}{16} = \frac{16}{144} - \frac{9}{144} = \frac{7}{144}$; $\$700 = \frac{7}{144}$.

$\frac{\overset{100}{\cancel{\$700}}}{\cancel{7}_{1}} \times 144 = \$14400$, Ans.

8. $100\% + 25\% = 125\%$; $\$5000 = 125\%$.

$\frac{\$5000}{125} \times 100 = \$4000$, cost of house.

$\$6000 - \$4000 = \$2000$, gain.

$\frac{2000}{4000} = \frac{1}{2}$; $\frac{1}{2}$ of $100\% = 50\%$ gain, Ans.

9. $100\% + \frac{3}{8}\% = 100\frac{3}{8}\%$; $\$12000 = 100\frac{3}{8}\%$.

$\frac{\$12000}{100\frac{3}{8}} \times 100 = \$11955.17$, sum expended.

$\$12000 - \$11955.17 = \$44.83$, brokerage.

10. $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$; $\frac{1}{12} = \$1200$.

$\frac{12}{12} = 12 \times \$1200 = \$14400$.

$62\frac{1}{2}\%$ of $\$14400 = \$9000$, Ans.

Article 439.

1. $100\% - 15\% = 85\%$; $37\frac{1}{2}\% = \frac{3}{8}$; $\frac{3}{8}$ of $85\% = 31\frac{7}{8}\%$.

$85\% - 31\frac{7}{8}\% = 53\frac{1}{8}\%$, remainder.

$53\frac{1}{8}\%$ of $\$5420 = \$2879.37\frac{1}{2}$, Ans.

2. $\$4563.20 \div 160 = \$28.52$, received for 1 acre.

$100\% - 8\% = 92\%$; $\$28.52 = 92\%$.

$\frac{\$28.52}{92} \times 100 = \$31$, Ans.

3. $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$.

$\$45337.50 = 102\frac{1}{2}\%$ of the investment.

$\frac{\$45337.50}{102\frac{1}{2}} \times 100 = \$44231.70\frac{39}{41}$, sum invested.

$\$45337.50 - \$44231.70\frac{39}{41} = \$1105.79\frac{1}{41}$, commission, Ans.

4. $87\frac{1}{2}\%$ of $\$1800 = \$1575$

$\$1575 \times .01\frac{1}{2} = \$26.25$, premium, Ans.

5. $\frac{3}{5}$ of $75\% = \frac{225}{5} = 45\%$; $\frac{2}{3}$ of $90\% = 60\%$.

$\frac{45}{60} = \frac{3}{4}$; $\frac{3}{4}$ of $100\% = 75\%$, Ans.

6. $45\% = \frac{45}{100} = \frac{9}{20}$; $\frac{9}{20}$ of $\frac{3}{4} = \frac{27}{80}$, part of the ship sold.

$\$36000$ = value of $\frac{27}{80}$ of the ship.

$\frac{\$36000}{27} \times 80 = \$106666\frac{2}{3}$, value of the ship.

$\frac{3}{4} - \frac{27}{80} = \frac{60}{80} - \frac{27}{80} = \frac{33}{80}$, what he still owned.

$\frac{33}{80}$ of $\$106666\frac{2}{3} = \$44000$, value of $\frac{33}{80}$, Ans.

7 1 mi. = 5280 ft.; 124 rd. 2 yd. $2\frac{1}{2}$ ft. $= 2054\frac{1}{2}$ ft.

$\frac{2054\frac{1}{2}}{5280} = \frac{4109}{10560}$ of $100\% = 38\frac{8}{33}\frac{1}{8}\%$, Ans.

8. $100\% - 40\% = 60\%$; $75\% = \frac{3}{4}$; $\frac{3}{4}$ of $60\% = 45\%$.

$\$4800 = 45\%$ of his debts.

$\frac{\$4800}{45} \times 100 = \$10666.66\frac{2}{3}$, Ans.

9. $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$.

$\$3675 = 102\frac{1}{2}\%$ of the investment.

$\frac{\$3675}{102\frac{1}{2}} \times 100 = \$3585.36\frac{24}{41}$, sum invested.

$\$3675 - \$3585.36\frac{24}{41} = \$89.63\frac{17}{41}$, commission, Ans.

10. $\$92.80 \div .03\frac{1}{3} = \$2784$, value of goods.

$\$2784 + \$92.80 = \$2876.80$, remittance.

Article 440.

1. $\frac{3}{8} \div \frac{5}{9} = \frac{3}{8} \times \frac{9}{5} = \frac{27}{40}$; $\frac{27}{40}$ of 100 % = 67½ %, Ans.

2. $\frac{45000}{67500} = \frac{2}{3}$ of 100 % = 66⅔ %, Ans.

3. 110 % of $ 200 = $ 220, selling price.
100 % − 10 % = 90 %.
$ 220 = 90 % of asking price.
$\frac{\$\,220}{90} \times 100 = \$\,244\frac{4}{9}$, asking price.

4. $ 1000 ÷ .02½ = $ 40000, Ans.

5. If ⅔ of a barrel is sold for ⅘ of the cost of a barrel, ⅔ of a barrel will be sold for 3 × ½ of ⅘ of the cost of a barrel, or ⅗ of the cost. The gain is, therefore, ⅕ the cost, or 20 %.

6. 10 % of $ 2500 = $ 250, gain; $ 2500 + $ 250 = $ 2750.
90 % of $ 2750 = $ 2475, received for the prints.
$ 2500 − $ 2475 = $ 25, loss, Ans.

7. $ 450 = 125 % of cost of 1st horse.
$\frac{\$\,450}{125} \times 100 = \$\,360$, cost of 1st horse.
$ 450 = 75 % of cost of 2d horse.
$\frac{\$\,450}{75} \times 100 = \$\,600$, cost of 2d horse.
$ 450 + $ 450 = $ 900, received for both horses.
$ 360 + $ 600 = $ 960, cost of both horses.
$ 960 − $ 900 = $ 60, loss.
$\frac{60}{960} = \frac{1}{16}$ of 100 % = 6¼ % loss, Ans.

8. $37\frac{1}{2}\%$ or $\frac{3}{8}$ of $\$1200 = \$450$.

$$\frac{450}{500} = \frac{9}{10} \text{ of } 100\% = 90\%, \text{ Ans.}$$

9. $12\frac{1}{2}\% - 8\% = 4\frac{1}{2}\%$; $\$0.18 = 4\frac{1}{2}\%$ of the cost.

$$\frac{\$0.18}{4\frac{1}{2}} \times 100 = \$4, \text{ cost per yd., Ans.}$$

10. $\$1$ in currency $= \$0.35\frac{4}{7}$ in gold.

$\$1$ in gold $= \$1 \div .35\frac{4}{7} = \$2.80$ currency, Ans.

Article 441.

1. $35\% + 45\% = 80\%$; $100\% - 80\% = 20\%$, what C owns.

$35\% = \frac{7}{20}$; $\frac{7}{20}$ of $\$125000 = \$43750$, A's share.

$45\% = \frac{9}{20}$; $\frac{9}{20}$ of $\$125000 = \$56250$, B's "

$20\% = \frac{1}{5}$; $\frac{1}{5}$ of $\$125000 = \$25000$, C's "

2. $\$5400 - \$4500 = \$900$, gain.

$$\frac{900}{4500} = \frac{1}{5} \text{ of } 100\% = 20\%, \text{ gain, Ans.}$$

3. 40% or $\frac{2}{5}$ of $\$65000 = \$26000$.

$\$26000 = 125\%$ of cost of 40% of goods.

$\frac{\$26000}{125} \times 100 = \$20800$, cost of 40% of goods.

$\$65000 - \$26000 = \$39000$.

$\$39000 = 130\%$ of cost of 60% of goods.

$\frac{\$39000}{130} \times 100 = \$30000$, cost of 60% of goods.

$\$20800 + \$30000 = \$50800$, Ans.

4. $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$; $\$4500 = 102\frac{1}{2}\%$.

$\frac{\$4500}{102\frac{1}{2}} \times 100 = \$4390.24\frac{14}{41}$, sum expended.

$\$4500 - \$4390.24\frac{14}{41} = \$109.75\frac{27}{41}$, commission.

5. 15% of $\$5000 = \$750$; $\$5000 - \$750 = \$4250$.

20% of $\$4250 = \$850$; $\$4250 - \$850 = \$3400$.

$\$750 + \$850 = \$1600$, what he had drawn.

$12\frac{1}{2}\%$ or $\frac{1}{8}$ of $\$1600 = \$200$.

$\$3400 + \$200 = \$3600$, Ans.

6. $\frac{9525}{15000} = \frac{127}{200} = .63\frac{1}{2}$, or $\$0.63\frac{1}{2}$, Ans.

7. $100\% - 25\% = 75\%$; $\$80 = 75\%$ of cost.

$\frac{\$80}{75} \times 100 = \$106.66\frac{2}{3}$, cost per acre.

$\$106.66\frac{2}{3} \times 1.40 = \$149.33\frac{1}{3}$, Ans.

8. $\$4500 \times .00\frac{3}{4} = \$33.75$, Ans.

9. $\$26.30 \times 6 = \$157.80$, yearly payment.

$100\% - 35\% = 65\%$.

65% of $\$157.80 = \$102.57$, Ans.

10. $\$0.66 - \$0.55 = \$0.11$, gain on 1 bushel of corn.

$\frac{11}{55} = \frac{1}{5}$ of $100\% = 20\%$, gain.

$\$1.37\frac{1}{2} - \$1.10 = \$0.27\frac{1}{2}$, gain on 1 bushel of wheat.

$\frac{27\frac{1}{2}}{110} = \frac{55}{220} = \frac{1}{4}$ of $100\% = 25\%$, gain.

$25\% - 20\% = 5\%$, greater profit on wheat, Ans.

Article 442.

1. 1 mile = 5280 ft.; 45% or $\frac{9}{20}$ of 5280 ft. = 2376 ft., Ans.

2. \$2800 − \$1600 = \$1200.

$$\frac{1200}{2800} = \frac{3}{7} \text{ of } 100\% = 42\tfrac{6}{7}\%, \text{ Ans.}$$

3. \$7500 = $37\frac{1}{2}\%$; $\frac{\$7500}{37\frac{1}{2}} \times 100 = \$20000$, Ans.

4. 75%, or $\frac{3}{4}$, of \$1600 = \$1200.

\$1200 = $62\frac{1}{2}\%$ of B's money.

$\frac{\$1200}{62\frac{1}{2}} \times 100 = \$1920$, B's money.

\$1600 + \$1920 = \$3520, Ans.

5. \$16.25 = 20% of cost of coal.

$\frac{\$16.25}{20} \times \frac{5}{100} = \$81.25$, cost of coal.

12500 lb. ÷ 2000 = 6.25 tons.

\$81.25 ÷ 6.25 = \$13, price per ton, Ans.

6. 1880 had 366 days; December has 31 days.

$$\frac{31}{366} \text{ of } 100\% = 8\tfrac{8}{183}\%, \text{ Ans.}$$

7. 100% − 40% = 60%; $25\% = \frac{1}{4}$; $\frac{1}{4}$ of 60% = 15%.

\$4800 = 15% of his indebtedness.

$\frac{\$4800}{15} \times \frac{20}{100} = \$32000$, Ans.

8. $100\% - 77\% = 23\%$; $2576 = 23\%$ of the population.

$$\frac{2576}{23} \times 100 = 11200, \text{ Ans.}$$

9. $\$92.80 \div .05\frac{1}{3} = \$1740$, value of the goods.

$\$1740 + \$92.80 = \$1832.80$, remittance.

10. $\$125000 \times .45 = \$56250$, base.

$\$56250 \times .04\frac{1}{2} = \$2531.25$, premium.

Article 443.

1. $115\% - 100\% = 15\%$; $\$0.09 = 15\%$ of cost.

$$\frac{\$0.09}{15} \times 100 = \$0.60, \text{ Ans.}$$

2. $\$900 \div .04\frac{1}{2} = \$20000$, Ans.

3. 1% of $\$5000 = \$50$.

$\$400 - \$50 = \$350$, what he would receive for rent above expenses.

$\$5000 \times .06 = \$300$.

$\$350 - \$300 = \$50$, annual gain by renting.

Ans. By renting, by $\$50$.

4. $100\% + 15\% = 115\%$; $\$874 = 115\%$.

$$\frac{\$874}{\cancel{115}\ 23} \times \frac{\overset{20}{\cancel{100}}}{1} = \$760, \text{ cost of goods, Ans.}$$

5. $\$5895 - \$4585 = \$1310$; $\frac{1}{2}$ of $\$1310 = \$655$, gain.

$\$5895 - \$655 = \$5240$, cost.

$$\frac{655}{5240} = \frac{131}{1048} \text{ of } 100\% = 12\frac{1}{2}\%, \text{ Ans.}$$

6. $\$2925 \div .04\frac{1}{2} = \$65000$, whole value.

$\frac{3}{8}$ of $\$65000 = \$24375$, Ans.

7. $\$24.80 = 20\%$ of cost; $\frac{\$24.80}{20} \times \overset{5}{100} = \$124$, cost, Ans.

8. $\$6.65 = 95\%$ of cost per bbl.

$\frac{\$6.65}{95} \times 100 = \$7$, cost per bbl.

$\$7 \times 1.05 = \$7.35$, Ans.

9. $\$500 \times .07\frac{1}{2} = \$36$, loss on the lot.

$\$36 = 12\%$ of the cost of the horse.

$\frac{\overset{3}{\$36}}{12} \times 100 = \$300$, cost of the horse.

$\$300 + \$36 = \$336$, received for the horse, Ans.

10. $\$1537.90 = 112\frac{2}{3}\%$; $\frac{\$1537.90}{112\frac{2}{3}} \times 100 = \$1365$, cost.

$\$1651.65 - \$1365 = \$286.65$, gain.

$\frac{286.65}{1365.00} = \frac{1911}{9100}$ of $100\% = 21\%$, gain, Ans.

Article 444.

1.

2) $\$125$ = Principal.

$.6250$ = 1 month's interest.

$39\frac{1}{10}$ = Time in months.

56250

18750

625

$\$24.4375$ = Interest at 6%.

4.0729 = " " 1%.

$\$28.5104$ = " " 7%.

125.

Ans. $\$153.5104$, Amount.

2. $\$1 \times .08 = \$0.08$, interest of $\$1$ for 1 year.

$\$1 \div \$0.08 = 12\frac{1}{2}$ years, or 12 y. 6 mo., Ans.

3. $\$1 \times .07 \times 3.4 = \$0.238$.

$\$1 + \$0.238 = \$1.238$, amount of $\$1$ for 3 y. 4 mo. 24 d.

$\$643.76 \div 1.238 = \$520$, Ans.

4. From Jan. 1, 1896, to July 4, 1898, = 2 y. 6 mo. 3 d.

2) $\$475$ = Principal.
2.375 = 1 month's interest.
$30\frac{1}{10}$ = Time in months.
71250
2375
4) $\$71.4875$ = Interest at 6 %.
17.8718 = " " $1\frac{1}{2}$ %.
$\$89.3593$ = " " $7\frac{1}{2}$ %.

5. $\$450 \times .06 \times 1\frac{1}{3} = \$36$, interest of $\$450$.

$\$1 \times .06 \times 1\frac{1}{3} = \$0.08$; $\$1 + \$0.08 = \$1.08$.

$\$450 \div \$1.08 = \$416.66\frac{2}{3}$, present worth of $\$450$.

$\$450 - \$416.66\frac{2}{3} = \$33.33\frac{1}{3}$, discount of $\$4.50$.

$\$36 - \$33.33\frac{1}{3} = \$2.66\frac{2}{3}$, Ans.

6. $\$450 - \$300 = \$150$.

$\$150 \times .06 = \$9$, interest of $\$150$ for 1 year.

$\$15.30 \div \$9 = 1\frac{7}{10}$; $1\frac{7}{10}$ y. = 1 y. 8 mo. 12 d., Ans.

7.

Principal	$875.00
Int. from Jan. 1, 1889, to Mar. 10, 1890, 1 y. 2 m. 9 d.	62.56
Amount	$937.56
1st payment	225.00
New principal	$712.56
Int. from Mar 10, 1890, to Apr. 1, 1891, 1 y. 22 d. .	45.37
Amount	$757.93
2d payment	145.00
New principal	$612.93
Int. from Apr. 1, 1891, to Dec. 31, 1891, 9 mo. . .	27.58
Amount due Dec. 31, 1891 . . . . . Ans.	$640.51

8. Interest of $450 for 6 mo. 3 d. at $7\frac{1}{2}\%$ = $17.16.

$450 − $17.16 = $432.84, proceeds, Ans.

9. Bank discount of $1 for 6 mo. 3 d. = $0.0305.

Proceeds of $1 = $1 − $0.0305 = $0.9695.

$800 ÷ $0.9695 = $825.17, face of note, Ans.

10. $0.15 × .04 × 15 = $0.09, int. of $0.15 for 15 y. at 4 %.

$15 × .08 × $\frac{1}{24}$ = $0.05, int. of $15 for 15 d. at 8 %.

$0.09 − $0.05 = $0.04, Ans.

Article 445.

1. $356.50 × .08 × $3\frac{4}{7}\frac{8}{2}$ = $108.93, interest of $356.50.

$480 × .07 = $33.60, interest of $480 for 1 y. at 7 %

$108.93 ÷ $33.60 = 3 y. 2 mo. 27+ d., Ans.

2. Interest of $1 for 3 mo. 24 d. at 7 % = 0.022\frac{1}{2}$.

$153.75 ÷ 0.022$\frac{1}{2}$ = $6936.09+, Ans.

3. $\$500 \times .01 \times 2\frac{2}{3} = \$12$, interest of $\$500$ at 1%.

$\$84 \div \$12 = 7 = 7\%$, Ans.

4. $\$1525 \times .04\frac{1}{2} = \$68.625$, 1 year's interest.

$$\frac{\$68.625 \times 214}{365} = \$40.23, \text{ Ans.}$$

5. Principal for 1st 6 mo.	$1360.00
Interest " "	54.40
Principal for 2d 6 mo.	$1414.40
Interest " "	56.58
Principal for 3d 6 mo.	$1470.98
Interest " "	58.84
Compound amount for 1 y. 6 mo. . . .	$1529.82
Given principal	1360.00
Compound interest for 1 y. 6 mo. . . Ans.	$169.82

6. Amount of $\$1$ for 1 y. 5 mo. 18 d. at $6\% = \$1.088$.

$\$1275 \div \$1.088 = \$1171.875$, present worth.

$\$1275 - \$1171.875 = \$103.125$, discount, Ans.

7. A negotiable note is one payable to the bearer, or to the payee's order.

A note payable to order is made negotiable by the payee writing his name on the back.

8. A note is due on demand, if the time for payment is not specified.

Interest will accrue from either the date of the demand of payment, or from maturity, if the words "with interest" are omitted.

9.

Principal	$750.00
Int. from Jan. 15, 1888, to Sept. 20, 1889, 1 y. 8 m. 5 d.	75.63
Amount	$825.63
1st payment	250.00
New principal	$575.63
Int. from Sept. 20, 1889, to June 12, 1890, 8 m. 23 d.	25.23
Amount	$600.86
2d payment	120.00
New principal	$480.86
Int. from June 12, 1890, to May 25, 1891, 11 m. 13 d.	27.49
Amount due May 25, 1891 . . . . . Ans.	$508.35

10. Bank discount of $1 for 9 mo. 18 d. at 7% = $0.056.
Proceeds of $1 = $1 − $0.056 = $0.944.

$1240 ÷ $0.944 = $1313.56—, Ans.

Article 446.

1. $700 × .07 × $2\frac{1}{2}$ = $122.50, simple interest.

Principal for 1st year	$700.00
Interest " "	49.00
Principal for 2d year	$749.00
Interest " "	52.43
Principal for 6 mo.	$801.43
Interest " "	28.05
Compound amount for 2 y. 6 mo.	$829.48
Given principal	$700.00
Compound interest for 2 y. 6 mo.	$129.48

$129.48 − $122.50 = $6.98, Ans.

2. Interest of $1 for 3 mo. 3d. at $7\frac{1}{2}$% = $0.019375.

$700 × .019375 = $13.56, bank discount, Ans.

3. $\$1 \times .06 \times 1\frac{1}{4} = \$0.075$.

$\$27.47 \div .075 = \$366.26\frac{2}{3}$, Ans.

4. $\$648 \times .01 \times 2\frac{107}{360} = \$14.886$, int. at 1 %.

$\$81.873 \div \$14.886 = 5\frac{1}{2}$; $5\frac{1}{2}$ %, Ans.

5. Bank discount of $\$1$ for 33 d. $= \$0.0055$.
Proceeds of $\$1 = \$1 - \$0.0055 = \$0.9945$.

$\$900 \div \$0.9945 = \$904.97+$, face of note, Ans.

6.

Principal	$\$365.00$
Int. from July 1, 1898, to Jan. 1, 1899, 6 mo.	10.95
Amount	$\$375.95$
1st payment	85.00
New principal	$\$290.95$
Int. from Jan. 1, 1899, to July 1, 1899, 6 mo.	8.73
Amount	$\$299.68$
2d payment	125.00
New principal	$\$174.68$
Int. from July 1, 1899, to Jan. 1, 1901, 1 y. 6 mo.	15.72
Amount due Jan. 1, 1901, Ans.	$\$190.40$

7.

Principal for 1st year	$\$245.00$
Interest " "	11.03
Principal for 2d year	$\$256.03$
Interest " "	11.52
Principal for 6 mo.	$\$267.55$
Interest " "	6.02
Compound amount	$\$273.57$
Given principal	245.00
Compound interest for 2 y. 6 mo. Ans.	$\$28.57$

8. Bank discount of $1 for 5 mo. 3 d. at 8% = $0.034.
Proceeds of $1 = $1 − $0.034 = $0.966.
$217.35 ÷ 0.966 = $225, face of note, Ans.

9. Interest of $1 for 93 d. at 8% = $0.0206⅔.
$450 × .0206⅔ = $9.30, bank discount.
$450 − $9.30 = $440.70, proceeds, Ans.

10.

Amount of $250 for 4 mo. 3 d. at 6% = $255.13.
4 mo. 3 d. after May 16, 1896, = Sept. 19, 1896, day of maturity.
From July 5 to Sept. 19 = 76 d., term of discount.
Interest of $255.13 for 76 d. at 7% = $3.77, bank discount.
$255.13 − $3.77 = $251.36, proceeds, Ans.

Article 447.

1. From May 6, 1889, to July 7, 1891, = 2 y. 2 mo. 1 d.

2) $105.23 = Principal.
.52615 = 1 month's interest.
$26\frac{1}{30}$ = Time in months.
315690
105230
1753
Ans. $13.69743, Interest.

2. $300 × .06 = $18.
$47.25 ÷ $18 = $2\frac{5}{8}$ y. = 2 y. 7 mo. 15 d., Ans.

3. $560 × .01 × $2\frac{3}{8}$ = $13.30, interest of $560 at 1%.
$106.40 ÷ $13.30 = 8; 8%, Ans.

4. Bank discount of $1 for 93 d. at 8% = $0.0206⅔.
Proceeds of $1 = $1 − $0.0206⅔ = $0.9793⅓.
$293.80 ÷ $0.9793⅓ = $300, face of note, Ans.

5. $\$650 \times .06 \times 2\frac{2}{3} = \$104$, simple interest.

Principal for 1st year	$650.00
Interest " "	39.00
Principal for 2d year	$689.00
Interest " "	41.34
Principal for 8 mo.	$730.34
Interest " "	29.21
Compound amount for 2 y. 8 mo.	$759.55
Given principal	650.00
Compound interest for 2 y. 8 mo.	$109.55

$\$109.55 - \$104 = \$5.55$, Ans.

6. $\$1 \times .08 \times \frac{2}{5} = \$0.032$, int. of $\$1$ for 4 mo. 24 d. at 8%.

$\$78.08 \div .032 = \$2440$, principal, Ans.

7. From Jan. 6, 1896, to April 18, 1896, = 3 mo. 12 d.

$\$500 \times .01 \times \frac{17}{60} = \$1.416\frac{2}{3}$, interest of $\$500$ at 1%.

$\$12.75 \div \$1.416\frac{2}{3} = 9$; rate, 9 per cent.

From Jan. 6, 1896, to Feb. 23, 1897, = 1 y. 1 mo. 17 d.

2) $\$500$ = Principal.
2.50 = 1 month's interest.
$13\frac{17}{30}$ = Time in months.
750
250
$1416\frac{2}{3}$
$\$33.916\frac{2}{3}$ = Interest at 6%.
$16.958\frac{1}{3}$ = " " 3%.
$\$50.875$ = " " 9%.
500
Ans. $\$550.875$ = Amount.

8.

Principal	$320.00
Int. from July 14, 1894, to Dec. 24, 1894, 5 mo. 10 d.	11.38
Amount	$331.38
Payment	180.00
New principal	$151.38
Int. from Dec. 24, 1894, to March 30, 1895, 3 mo. 6 d.	3.23
Amount due March 30, 1895 . . . . . Ans.	$154.61

9. From July 6, 1891, to Nov. 18, 1891, = 135 d.
135 d. + 3 d. = 138 d., term of discount.
Int. of $1728 for 138 d. at 6 % = $39.744, bank discount.

$1728 − $39.744 = $1688.256, proceeds, Ans.

10.

Principal for 1st 6 mo.		$860.00
Interest	" "	30.10
Principal for 2d 6 mo.		$890.10
Interest	" "	31.15
Principal for 3d 6 mo.		$921.25
Interest	" "	32.24
Compound amount for 18 mo. . . .	Ans.	$953.49

Article 448.

1. $275 − $175 = $100, interest.
$175 × .06 = $10.50; $100 ÷ $10.50 = $9\frac{1}{21}$.

$9\frac{1}{21}$ y. = 9 y. 6 mo. $8\frac{4}{7}$ d., Ans.

2. From Jan. 10, 1891, to July 10, 1891, = 6 mo.

$\$500 \times .01 \times \frac{1}{2} = \$2.50.$

$\$529.16\frac{2}{3} - \$500 = \$29.16\frac{2}{3}$, interest.

$\$29.16\frac{2}{3} \div \$2.50 = 11\frac{2}{3}$ per cent, Ans.

3. From July 5, 1888, to June 1, 1890, = 1 y. 10 mo. 27 d.

$$
\begin{array}{rl}
2\,)\,\$\,1250 & = \text{Principal.} \\
\underline{\quad 6.25} & = \text{1 month's interest.} \\
22\frac{9}{10} & = \text{Time in months.} \\
\hline
1250 & \\
1250 & \\
5625 & \\
\hline
3\,)\,\$\,143.125 & = \text{Interest at 6 \%.} \\
47.708\frac{1}{3} & = \text{“ “ 2 \%.} \\
\hline
\$\,190.833\frac{1}{3} & = \text{“ “ 8 \%.} \\
1250. & \\
\hline
\text{Ans. } \$\,1440.833\frac{1}{3} & = \text{Amount.}
\end{array}
$$

4. Amount of $1 for 60 d. at 6% = $1.01.

$450 ÷ $1.01 = $445.544, present worth.

$450 − $445.544 = $4.456, discount.

Int. of $450 for 63 d. at 6% = $4.725, bank discount.

$4.725 − $4.456 = $0.269, Ans.

5.

Principal	$425.00
Int. from Mar. 25, 1890, to June 1, 1891, 1 y. 2 mo. 7 d.	40.33
Amount	$465.33
1st payment	75.00
New principal	$390.33
Int. from June 1, 1891, to Dec. 30, 1891, 6 mo. 29 d.	18.13
Amount	$408.46
2d payment	120.00
New principal	$288.46
Int. from Dec. 30, 1891, to Sept. 1, 1892, 8 mo. 2 d.	15.51
Amount due Sept. 1, 1892 . . . . . Ans.	$303.97

6. $1 × .07 × $2\frac{1}{2}$ = $0.175; $1 + $0.175 = $1.175.

$1410 ÷ $1.175 = $1200, present worth.

$1410 − $1200 = $210, discount, Ans.

7. 3 mo. 3 d. after May 10 = Aug. 13, day of maturity.
From June 10 to Aug. 13 = 64 d., term of discount.
Int. of \$ 1 for 64 d. at 6 % = \$ 0.010$\frac{2}{3}$, bank discount.
\$ 1 − \$ 0.010$\frac{2}{3}$ = \$ 0.989$\frac{1}{3}$, proceeds.
\$ 395.80 ÷ .989$\frac{1}{3}$ = \$ 400.06$\frac{2}{3}\frac{4}{7}\frac{4}{1}$, face of note, Ans.

8.

Principal	\$ 2000.00
Int. fr. June 15, 1890, to Aug. 27, 1891, 1y. 2m. 12d.	192.00
Amount	\$ 2192.00
Payment	1450.00
Amount due Aug. 27, 1891	\$ 742.00

\$ 742. *Aug. 27, 1891.*

For value received I promise to pay Henry Smith, or order, seven hundred forty-two dollars, on demand, with interest at 8 per cent.

GEORGE PAGE.

9. \$ 500000 × .03$\frac{1}{2}$ = \$ 17500, annual income.
\$ 17500 ÷ 4 = \$ 4375, quarterly income.

10. The annual income of a share of 8 % stock is \$ 8. If the cost is 160, the income is $\frac{8}{160}$, or 5 %, of the cost. The annual income of a share of 4 % stock is \$ 4. If the cost is 120, the income is $\frac{4}{120}$, or 3$\frac{1}{3}$ %, of the cost.
5 % − 3$\frac{1}{3}$ % = 1$\frac{2}{3}$ % on the investment, loss, Ans.

Article 449.

1.

The annual income of a share of 6 % stock is \$ 6.
If the cost is 120, the income is $\frac{6}{120}$, or $\frac{1}{20}$, or 5 %, of the cost, Ans.

2. \$ 1800 ÷ .04$\frac{1}{2}$ = \$ 40000, sum invested, Ans.

3. 10 % of $100 = $10.
$100 − $10 = $90, the cost of one share.
$112 − $90 = $22, gain on one share.

$$\frac{22}{90} = \frac{11}{45}; \quad \frac{11}{45} \text{ of } 100\,\% = 24\tfrac{4}{9}\,\%, \text{ gain, Ans.}$$

4. 100 % − 33 % = 67 %.
67 % of $100 = $67, cost of 1 share.
100 % − 20 % = 80 %.
80% of $100 = $80, what 1 share was sold for.
$80 − $67 = $13, gain on 1 share.

$$\frac{13}{67} \text{ of } 100\,\% = 19\tfrac{47}{67}\,\% \text{ gain, Ans.}$$

5. $164½ + ¼ = $164¾, cost of 1 share.
$25000 ÷ 164¾ = 151 shares. $122¾ left, Ans.

6. 300 × 4 mo. = 1200 mo.
If he can have $1 for 1200 mo., he can have $800 as many months as 1200 ÷ 800, = 1½ mo., Ans.

7.
700 × 10 mo. = 7000 mo.
300
200 × 6 mo. = 1200 mo.
200
) 5800 "
29 mo.

29 mo. − 10 mo. = 19 mo., Ans.

8. £500 6 *d.* = £500.025.
$4.86½ × 500.025 = 2432.62\frac{13}{100}$, Ans.

9. March 11, 1890, + 4 mo. = July 11, 1890.

April 7 to July 11 = 95 d.; May 15 to July 11 = 57 d.
June 20 to July 11 = 21 d.

$$\begin{array}{rrl} 400 & \times 95 \text{ d.} & = 38000 \text{ d.} \\ 270 & \times 57 \text{ “} & = 15390 \text{ “} \\ 350 & \times 21 \text{ “} & = 7350 \text{ “} \\ \hline 1020 & & 60740 \text{ d.} \end{array}$$

$\$1850 - \$1020 = \$830$; $60740 \text{ d.} \div 830 = 73+ \text{ d.}$

July 11, 1890, + 73 d. = Sept. 22, 1890, Ans.

10.

$$\begin{array}{rrl} 2400 & & \\ \hline 600 & & \\ 800 & \times 6 = & 4800 \text{ mo.} \\ \hline 1000 & \times 10 = & 10000 \text{ “} \\ 2400 &) & \overline{14800} \text{ “} \\ & & 6\tfrac{1}{6} \text{ mo.} = 6 \text{ mo. } 5 \text{ d.} \end{array}$$

Aug. 1 + 6 mo. 5 d. = Feb. 6, 1882, Ans.

Article 450.

1. $\frac{1}{2}$ of $\frac{5}{8} = \frac{5}{16}$; $\frac{5}{16} \div 2\frac{2}{3} = \frac{5}{16} \times \frac{5}{12} = \frac{25}{192}$, Ans.

2. £44 16 *s.* = £44.8; £5 12 *s.* = £5.6
44.8 : 5.6 = 72 yd. : x

$$\frac{\overset{9}{\cancel{5.6} \times \cancel{72}}}{\underset{8}{\cancel{44.8}}} = 9 \text{ yd., Ans.}$$

3. $\left.\begin{array}{l} 18 : 8 \\ 3\frac{4}{8} : 2\frac{1}{3} \\ 67\frac{1}{2} : 450 \end{array}\right\} = 4\frac{1}{2} \text{ ft.} : x$

$$\frac{\overset{4}{\cancel{8}} \times \overset{2}{\cancel{6}} \times \cancel{2} \times \cancel{5} \times \overset{50}{\cancel{450}} \times \overset{9}{\cancel{9}}}{\underset{9}{\cancel{18}} \times 23 \times \underset{27}{\cancel{135}} \times \cancel{2} \times \cancel{2}} =$$

$\cancel{3}$ $8\frac{1}{23}$ ft., Ans.

4. $12 : 7 = 15\frac{1}{2}$ d. $: x$ $\quad \frac{7 \times 31}{12 \times 2} = \frac{217}{24} = 9\frac{1}{24}$ days, Ans.

5. $\left.\begin{matrix} 10 : 11 \\ 10 : 11 \end{matrix}\right\} = 6$ oz. $: x$ $\quad \frac{11 \times 11 \times 6}{10 \times 10} = 7\frac{13}{50}$ ounces, Ans.

6. $\left.\begin{matrix} 9 : 5 \\ 2\frac{1}{2} : 3\frac{3}{3} \\ 8 : 7\frac{1}{2} \end{matrix}\right\} = 30$ acres $: x$ $\quad \frac{\overset{5}{\cancel{15}} \qquad \overset{5}{\cancel{15}}}{\underset{3}{\cancel{9}} \times \cancel{5} \times \underset{4}{\cancel{8}} \times 3 \times \cancel{2}} \times \cancel{30} \times 11 \times \cancel{15} =$

$22\frac{1}{2}\frac{1}{2}$ acres, Ans.

7. $\left.\begin{matrix} 75 : 50 \\ \frac{14}{16} : 1\frac{1}{2} \end{matrix}\right\} :: 4\frac{1}{2}$ mo. $: x$ $\quad \frac{\overset{2}{\cancel{50}} \times \overset{4}{\cancel{16}} \times 3 \times 9}{\underset{3}{\cancel{75}} \times \underset{7}{\cancel{14}} \times \cancel{2} \times \cancel{2}} = 5\frac{1}{7}$ mo., Ans.

8. $\left.\begin{matrix} 32 : 48 \\ 60 : 80 \\ 6 : 8 \end{matrix}\right\} = 36$ men $: x$ $\quad \frac{\overset{12}{\cancel{48}} \times \overset{4}{\cancel{80}} \times \overset{2}{\cancel{8}} \times \overset{}{\cancel{36}}}{\underset{4}{\cancel{32}} \times \underset{3}{\cancel{60}} \times \cancel{6}} = 96$ men, Ans.

9. $\left.\begin{matrix} 25 : 45 \\ 4 : 7\frac{1}{2} \\ 3 : 6 \\ 9 : 8 \\ 9\frac{1}{2} : 8\frac{1}{2} \end{matrix}\right\} = 19$ men $: x$

$$\frac{\overset{3}{\cancel{9}} \quad \overset{}{\cancel{3}} \quad \overset{}{\cancel{2}} \quad 2}{\underset{5}{\cancel{25}} \times \cancel{2} \times \cancel{4} \times \cancel{9} \times \cancel{2} \times \cancel{3} \times \cancel{19}} \times \cancel{45} \times \cancel{15} \times \cancel{6} \times \cancel{8} \times 17 \times \cancel{19} \times \cancel{2} = 102 \text{ men, Ans.}$$

10. $\left.\begin{matrix} 36 : 48 \\ 12 : 9 \\ 12 : 9 \end{matrix}\right\} = 8$ men $: x$ $\quad \frac{\overset{4}{\cancel{48}} \times \overset{3}{\cancel{9}} \times \overset{2}{\cancel{9}} \times \overset{}{\cancel{8}}}{\underset{3}{\cancel{36}} \times \underset{3}{\cancel{12}} \times \underset{4}{\cancel{12}}} = 6$ men, Ans.

Article 451.

1. $\frac{9}{9} - \frac{5}{9} = \frac{4}{9}$, A's part of capital.

$\frac{4}{9}$ of \$ 4500 = \$ 2000, A's share of gain.

2. 3 cows for 2 mo. = 6 cows for 1 mo.
2 " " 4 " = 8 " "
$2\frac{2}{3}$ " " 3 " = 8 " "
The entire stock = $\overline{22}$ " "

$\frac{6}{22} = \frac{3}{11}$; $\frac{3}{11}$ of \$ 55 = \$ 15, 1st man pays.

$\frac{8}{22} = \frac{4}{11}$; $\frac{4}{11}$ of \$ 55 = \$ 20, 2d " "

$\frac{8}{22} = \frac{4}{11}$; $\frac{4}{11}$ of \$ 55 = \$ 20, 3d " "

3. \$ 2000 for 4 mo. = \$ 8000 for 1 mo.
\$ 3000 " 8 " = 24000 "
Ames's entire stock = $\overline{\$\ 32000}$ "

Howe's \$ 2000 for 12 mo. = \$ 24000 for 1 mo.

\$ 32000 + \$ 24000 = \$ 56000, entire capital.

$\frac{32000}{56000} = \frac{4}{7}$; $\frac{4}{7}$ of \$ 2800 = \$ 1600, Ames's gain.

$\frac{24000}{56000} = \frac{3}{7}$; $\frac{3}{7}$ of \$ 2800 = \$ 1200, Howe's gain.

4. $280 \times \$1.25 = \$350$.

$125 + 150 + 200 + 225 = 700$ sheep.

A's stock $= \frac{125}{700} = \frac{5}{28}$; $\frac{5}{28}$ of $\$350 = \$62.50$, A pays.

B's " $= \frac{150}{700} = \frac{3}{14}$; $\frac{3}{14}$ of $\$350 = \$75.00$, B "

C's " $= \frac{200}{700} = \frac{2}{7}$; $\frac{2}{7}$ of $\$350 = \$100.00$, C "

D's " $= \frac{225}{700} = \frac{9}{28}$; $\frac{9}{28}$ of $\$350 = \$112.50$, D "

5. $\$800 + \$1000 = \$1800$.

$\$2250 - \$1800 = \$450$, C's gain.

C has $\frac{450}{2250} = \frac{1}{5}$ of whole gain; he must have $\frac{1}{5}$ of whole capital.

$\$3000 = \frac{1}{5}$; $\frac{5}{5} = 5 \times \$3000 = \$15000$.

A's gain $= \frac{800}{2250} = \frac{16}{45}$; $\frac{16}{45}$ of $\$15000 = \$5333\frac{1}{3}$, A's stock.

B's " $= \frac{1000}{2250} = \frac{4}{9}$; $\frac{4}{9}$ of $\$15000 = \$6666\frac{2}{3}$, B's stock.

6. A's $\$1300$ for 12 mo. $= \$15600$ for 1 mo.

B's $\$1000$ " 10 " $=$ 10000 "

C's $\$900$ " 5 " $=$ 4500 "

The entire stock $= \$30100$ "

$\frac{15600}{30100} = \frac{156}{301}$; $\frac{156}{301}$ of $\$750 = \$388\frac{312}{301}$, A's gain.

$\frac{10000}{30100} = \frac{100}{301}$; $\frac{100}{301}$ of $\$750 = \$249\frac{51}{301}$, B's "

$\frac{4500}{30100} = \frac{45}{301}$; $\frac{45}{301}$ of $\$750 = \$112\frac{38}{301}$, C's "

7 $\$4000 = \frac{2}{5}$ of capital.

$\frac{\$4000}{2} \times 5 = \$10000$, whole capital.

20 % of $\$10000 = \$2000$.

$\$2000 - \$500 = \$1500$, net gain.

$\frac{3}{5}$ of $\$1500 = \$900$, 1st man's share.

$\frac{2}{5}$ of $\$1500 = \$600$, 2d " "

8. $\$6 + \$10 + \$14 = \$30$; $\frac{7}{15}$ of $\$37680 = \$17584$.

$\frac{6}{30} = \frac{1}{5}$; $\frac{1}{5}$ of $\$17584 = \$3516.80$, A's gain.

$\frac{10}{30} = \frac{1}{3}$; $\frac{1}{3}$ of $\$17584 = \$5861.33\frac{1}{3}$, B's gain.

$\frac{14}{30} = \frac{7}{15}$; $\frac{7}{15}$ of $\$17584 = \$8205.86\frac{2}{3}$, C's gain.

9.

A can do $\frac{1}{6}$ in 1 day; B can do $\frac{1}{8}$ in 1 day; C can do $\frac{1}{10}$ in 1 day.

They can all do $\frac{1}{6} + \frac{1}{8} + \frac{1}{10}, = \frac{47}{120}$, in 1 day. It will take as many days to do the whole as $\frac{120}{120} \div \frac{47}{120} = 2\frac{26}{47}$ days, Ans.

10. $\$1800 + \$750 + \$1950 = \$4500$.

$\$205 + \$260 + \$1200 = \$1665$.

$\frac{1665}{4500} = \frac{37}{100} = 37\,\%$, what he can pay.

37 % of $\$1800 = \$666$, A receives.

37 % of $\$750 = \$277.50$, B receives.

37 % of $\$1950 = \$721.50$, C receives.

Article 452.

1. $92'54'44$ (962, Ans.

$$\begin{array}{r|l} & 81 \\ 186 & 1154 \\ & 1116 \\ \hline 1922 & 3844 \\ & 3844 \\ \hline \end{array}$$

2. $\sqrt{.1369} + \sqrt{1296} = .37 + 36 = 36.37$, Ans.

3. $160^2 - 130^2 = 25600 - 16900 = 8700$

$\sqrt{8700} = 93.27$ ft., Ans.

4. $216 \times 24 = 5184$ sq. rd.; $\sqrt{5184} = 72$ rd.

(216 + 24), or 240, $\times$ 2 = 480 rd. around the 1st field.

$72 \times 4 = 288$ rd. around the 2d field.

\$ 312 $\div$ 480 = \$ 0.65, cost of 1 rd.

$288 \times \$\ 0.65 = \$\ 187\frac{1}{5}$, Ans.

5. $0.008^3 = 0.000000512$; $\sqrt[3]{0.008} = 0.2$

$0.2 - 0.000000512 = 0.199999488$, Ans.

6. 810 sq. ft. $\times$ 10 = 8100 sq. ft., area of garden.

$\sqrt{8100} = 90$ ft. on 1 side.

90 ft. $\times 4 = 360$ ft. around the garden.

360 ft. $\div 16\frac{1}{2} = 21\frac{8}{11}$ rd., Ans.

7. $34'012'224$ (324, Ans.

	27
2700	7012
180	
4	
2884	5768
307200	1244224
3840	
16	
311056	1244224

8. $800^2 + 600^2 = 640000 + 360000 = 1000000.$

$\sqrt{1000000} = 1000^{\text{m}}$, length of diagonal.

1000 meters = 10 hektometers.

$$1\tfrac{1}{2} \text{ min.} \times 10 = 12 \text{ min., Ans.}$$

9. $12.5 \times 10 \times 5 = 625$ cu. ft.

$\sqrt[3]{625} = 8.549+$ ft., or 8.55 ft. nearly, Ans.

10. $80^2 + 60^2 = 6400 + 3600 = 10000$

$\sqrt{10000} = 100$ ft., slant height.

100 ft. $\times$ 60 ft. = 6000 sq. ft. on 1 side.

6000 sq. ft. $\times$ 4 = 24000 sq. ft. of surface.

$120^2 = 14400$ sq. ft., area of base.

$$14400 \times \frac{80}{3} = 384000 \text{ cu. ft., Ans.}$$

Article 453.

1 $45^2 : 60^2 = \$75 : x$

Or, $2025 : 3600 = \$75 : \$133\tfrac{1}{3}$, Ans.

2. $\sqrt{373'248} = 72$ in., Ans.

	343
14700	30248
420	
4	
15124	30248

3. 116 ft. − 80 ft. = 36 ft., perpendicular of triangle.

$160^2 + 36^2 = 25600 + 1296 = 26896$

$\sqrt{26896} = 164$ ft., Ans.

4. 1 acre = 160 sq. rd.; $\sqrt{160} = 12.6491+$ rd.

$12.6491 \times 4 = 50.5964$ rd.; $50.5964 - 4 = 46.5964$ rd.

$46.5964 \times 1 = 46.5964$ rd., Ans.

5. 12 h. $\times$ 4 = 48 h. = 2880 min.

$2880 \div 15 = 192$ miles, A walks in 4 days.

$2880 \div 12 = 240$ miles, B " " "

$240^2 + 192^2 = 57600 + 36864 = 94464$

$\sqrt{94464} = 307.3+$ miles, Ans.

6. $\sqrt[3]{262144} = 64$ in.; $64^2 = 4096$ sq. in., area of 1 face.

$4096 \times 6 = 24576$ sq. in., entire surface.

$64^2 + 64^2 = 4096 + 4096 = 8192$

$\sqrt{8192} = 90.5+$ in., diagonal of one face.

$64^2 + 90.5+^2 = 4096 + 8192 = 12288$

$\sqrt{12288} = 110.8+$ in., length of diagonal, Ans.

7. $4^3 : 12^3 = 1 : x$, or $64 : 1728 = 1 : 27$, Ans.

8. $20^2 - 12^2 = 400 - 144 = 256$; $\sqrt{256} = 16$ ft.
16 ft. × 2 ft. = 32 sq. ft. covered when the board is raised.
20 × 2 = 40 sq. ft. covered when the board is flat.
40 sq. ft. − 32 sq. ft. = 8 sq. ft., Ans.

9. $35^2 - 15^2 = 1225 - 225 = 1000$
$\sqrt{1000} = 31.62+$ ft., half of width of house.
31.62 ft. × 2 = 63.24 ft., width of house, Ans.

10. 100 × 100 × 1 = 10000 cu. ft. in garden 1 ft. deep.
100 × 4 = 400 ft. around the garden.
400 ft. × 4 ft. = 1600 sq. ft. in ditch, except corners.
$4^2 \times 4 = 64$ sq. ft. in corners.
1600 sq. ft. + 64 sq. ft. = 1664 sq. ft. in ditch.
$10000 \div 1664 = 6\frac{1}{104}$ ft., depth of ditch, Ans.

Article 454

1.

$$\frac{\frac{3}{4} \text{ of } \frac{4}{5} \text{ of } 37\frac{1}{2}}{24\frac{1}{2} - 18\frac{3}{4}} = \frac{\frac{3}{\cancel{4}} \text{ of } \frac{\cancel{4}}{5} \text{ of } \frac{\overset{15}{\cancel{75}}}{2}}{\frac{98}{4} - \frac{75}{4}} = \frac{\frac{45}{2}}{\frac{23}{4}} = \frac{45}{\cancel{2}} \times \frac{\overset{2}{\cancel{4}}}{23} = \frac{90}{23} = 3\tfrac{21}{23}, \text{ Ans}$$

2. $\frac{3}{8}$ cwt. $= \frac{3}{8} \div 20 = \frac{3}{160}$ ton.

$$\frac{\frac{3}{160}}{\frac{7}{8}} = \frac{3}{\cancel{160}\ 20} \times \frac{\cancel{8}}{7} = \frac{3}{140} = .0214\tfrac{2}{7}, \text{ Ans.}$$

3. 25 % of \$ 2000 = \$ 500, gain.
\$ 2000 + \$ 500 = \$ 2500, what it was sold for.
\$ 2500 = $87\frac{1}{2}$ % of what he asked.
$\frac{\$\ 2500}{87\frac{1}{2}} \times 100 = \$\ 2857\frac{1}{7}$, what he asked, Ans.

4.

Principal	$400.00
Interest for 1 year	28.00
Amount	$428.00
1st payment	100.00
New principal	$328.00
Interest for 1 year	22.96
Amount	$350.96
2d payment	100.00
New principal	$250.96
Interest for 1 year	17.57
Amount	$268.53
3d payment	100.00
New principal	$168.53
Interest for 4 mo.	3.93
Amount due 3 y. 4 mo. from date . . Ans.	$172.46

5. Interest of $1 for 93 d. at 7% = 0.0180\frac{5}{8}$.

$1250 × 0.0180$\frac{5}{8}$ = $22.60, bank discount.

$1250 − $22.60 = $1227.40, proceeds, Ans.

6. Time to midnight = $\frac{3}{5}$ of time to midnight; time past noon = $\frac{2}{5}$ of time to midnight; the time from noon to midnight, 12 hours, is $\frac{3}{5} + \frac{2}{5}$, or $\frac{5}{5}$, of the time to midnight. 12 hours is $\frac{5}{5}$ of 7$\frac{1}{5}$ hours. The time to midnight being 7$\frac{1}{5}$ hours, the time past noon is 12 hours − 7$\frac{1}{5}$ hours, or 4$\frac{4}{5}$ hours, or 4.48 P.M., Ans.

7. $\frac{1}{4}$ acre = 10890 sq. ft.; 9 in. = $\frac{3}{4}$ ft.

$10890 \times \frac{3}{4} \times \frac{1}{27} = 302\frac{1}{2}$ cu. yd.

$0.50 × 302$\frac{1}{2}$ = $151.25, Ans.

8. $108 \times 48 = 5184$ sq. rd.; $\sqrt{5184} = 72$ rd.
(108 + 48), or 156, $\times$ 2 = 312 rd. around the 1st field.
$72 \times 4 = 288$ rd. around the 2d field.
\$202.80 $\div$ 312 = \$0.65, cost of 1 rd.
$288 \times$ \$0.65 = \$187.20, Ans.

9.

74′088 (42, Ans.
64

4800	10088
240	
4	
5044	10088

10.

$$\left.\begin{array}{r} 21 : 7 \\ 60 : 80 \\ 6 : 8 \\ 3 : 4 \end{array}\right\} = 12 : x \qquad \frac{\overset{4}{\cancel{7}} \times \overset{4}{\cancel{80}} \times \overset{4}{\cancel{8}} \times 4 \times \overset{4}{\cancel{12}}}{\underset{3}{\cancel{21}} \times \underset{3}{\cancel{60}} \times \underset{3}{\cancel{6}} \times \cancel{3}} = \frac{256}{27} = 9\tfrac{13}{27} \text{ d., Ans.}$$

Article 455.

1. 6 ft. $\times$ $3\frac{1}{3}$ ft. = 19 sq. ft.
27 $\times$ 19 sq. ft. = 513 sq. ft. = 57 sq. yd.

$$57 \div \frac{3}{4} = 76 \text{ yd., Ans.}$$

2.

Principal for 1st year	\$200.00
Interest " "	16.00
Principal for 2d year	\$216.00
Interest " "	17.28
Principal for 6 mo. 6 d.	\$233.28
Interest " "	9.64
Compound amount for 2 y. 6 mo. 6 d.. Ans.	\$242.92

3. 102 A. 64 sq. rd. = 16384 sq. rd.

$$\sqrt{16384} = 128 \text{ rd., Ans.}$$

4. $47\frac{3}{8}\frac{7}{13}\frac{5}{9} = \frac{24389}{512}$

$$\sqrt[3]{\frac{24389}{512}} = \frac{\sqrt[3]{24389}}{\sqrt[3]{512}} = \frac{29}{8} = 3\tfrac{5}{8} \text{ ft., Ans.}$$

5. $600 \div .012 = 50000$; $50000 \times .05 = 2500$

$.005 \div 2500 = .000002$, Ans.

6. $4\frac{3}{7} \div .03 = 142\frac{6}{7}$; $142\frac{6}{7} : 6\frac{1}{2} = x : 8\frac{1}{3}$

$$\frac{2 \times 1000 \times 25}{13 \times 7 \times 3} = \frac{50000}{273} = 183\tfrac{41}{273}, \text{ Ans.}$$

7. 25% of \$420 = \$105, gain.

\$420 + \$105 = \$525, what it was sold for.

63 gal. — $10\frac{1}{2}$ gal. = $52\frac{1}{2}$ gal.

\$525 ÷ $52\frac{1}{2}$ = \$10, Ans.

8. From Aug. 18, 1890, to Apr. 30, 1892, = 1 y. 8 mo. 12 d.

2) \$1200 = Principal.

\$6.00 = 1 month's interest.

$20\frac{2}{3}$ = Time in months.

12000

240

\$122.40 = interest at 6%.

30.60 = " " $1\frac{1}{2}$%.

\$91.80 = " " $4\frac{1}{2}$%.

9. 25 : 12
6 : 5
10 : 8 } = 200 : x

$$\frac{\overset{2}{\cancel{12}} \times \cancel{5} \times 8 \times \overset{8}{\cancel{200}}}{\underset{5}{\cancel{25}} \times \cancel{6} \times \cancel{10}} = 64 \text{ rd., Ans.}$$

10. 7000 × 15 d. = 105000 d. If he can have $1 for 105000 d. he can have $7500 as many days as 105000 ÷ 7500 = 14 days, Ans.

Article 456.

1. The value of 7 in the number 78.342 is 70, and of 2 is 0.002. 70 ÷ 0.002 = 35000. That is, the value of the 7 is 35000 times as great as that of the 2.

2. $\frac{3\frac{1}{3}}{7\frac{1}{2}} = \frac{\overset{2}{\cancel{10}}}{3} \times \frac{2}{\underset{3}{\cancel{15}}} = \frac{4}{9}$; $\frac{\overset{2}{\cancel{4}}}{9}$ of $\frac{25}{\cancel{2}} = \frac{50}{9}$

$$\frac{50}{9} - 4\tfrac{5}{6} = \frac{100}{18} - \frac{87}{18} = \frac{13}{18}, \text{ Ans.}$$

3. 85 % of .36 = .306; .306 of the value of the ship = $22950.

$$\frac{\$22950}{306} \times 1000 = \$75000, \text{ Ans.}$$

4. $8000 − $3200 = $4800, net earnings.

$4800 ÷ $80000 = .06 = 6 %.

The annual income of a share of 6 % stock is $6. If the cost is $120, the income is $\frac{6}{120}$, or $\frac{1}{20}$, or 5 %, of the cost. Ans. 5 %.

5. $625 × .08 × $2\frac{1}{2}$ = $125, simple interest.

Principal for 1st year	$625.00
Interest " "	50.00
Principal for 2d year	$675.00
Interest " "	54.00
Principal for 6 mo.	$729.00
Interest " "	29.16
Compound amount for 2 y. 6 mo.	$758.16
Given principal	625.00
Compound interest for 2 y. 6 mo.	$133.16

$133.16 − $125 = $8.16, Ans.

6. 93 d. after Feb. 12, 1891, = May 16, 1891, date when due.
Int. of \$ 1250 for 93 d. at 6 % = \$ 19.375, bank discount.

\$ 1250 — \$ 19.375 = \$ 1230.625, proceeds, Ans.

7. $\left.\begin{matrix} 5 : 6 \\ 14 : 25 \\ 8 : 10 \end{matrix}\right\} = 2 : 5\frac{5}{14}$. $\frac{\overset{3}{\cancel{6}} \times 25 \times \overset{2}{\cancel{10}} \times \overset{2}{\cancel{2}}}{\underset{4}{\cancel{5}} \times 14 \times \cancel{8}} = \frac{75}{14} = 5\frac{5}{14}$ d., Ans.

8.

80 sq. rd.	80 sq. rd.

1 A. = 160 sq. rd.; $\frac{1}{2}$ A. = 80 sq. rd.
$\sqrt{80}$ = width of rectangle.
$2 \times \sqrt{80}$ = length of rectangle.

$(\sqrt{80})^2 + (2 \times \sqrt{80})^2 = 80 + (4 \times 80) = 400.$

$\sqrt{400}$ = 20 rd. in diagonal, Ans.

9. 12 in. × 3.1416 = 37.6992 in., circumference of base.

$37.6992 \times \frac{12}{2} = 226.1952$

226.1952 ÷ 2 = 113.0976 sq. in., area of base.

$113.0976 \times \frac{12}{3} = 452.39$ cu. in., Ans.

10. 1 meter = 1 ten-millionth part of the distance on a meridian from the equator to the pole. Hence $\frac{1}{4}$ of the circumference of the earth = 10000000 meters; 4 times 10000000 meters = circumference of earth. The circumference divided by 3.1416 (Art. 222) will give the diameter.

Article 457.

1. $\$200 \times .08 \times 1\frac{23}{60} = \$27.47$, simple interest.
$\$200 + \$27.47 = \$227.47$, amount.

Principal for 1 year.	$200.00
Interest " "	16.00
Principal for 8 mo. 18 d.	$216.00
Interest " " "	12.38
Compound amount for 1 y. 8 mo. 18 d. . .	$228.38

$\$228.38 - \$227.47 = \$0.91$, Ans.

2. $\left.\begin{matrix} 8:6 \\ 4:10 \\ 12:9 \end{matrix}\right\} = 18 : x \quad \frac{\overset{5}{\cancel{6}} \times \cancel{10} \times 9 \times \overset{9}{\cancel{18}}}{\underset{4}{\cancel{8}} \times 4 \times \underset{2}{\cancel{12}}} = \frac{405}{16} =$ $25\frac{5}{16}$ A., Ans.

3. $\$15000 \div 1.25 = \$12000$.
Hence $\$15000$ in currency $= \$12000$ in gold.
$\$12000 - \$10000 = \$2000$, gain.

$\frac{2000}{10000} = \frac{1}{5}$; $\frac{1}{5}$ of $100\% = 20\%$, gain, Ans.

4. 1 gross $= 144$ tacks.
$\$0.00002 \times 144 = \$0.00288$, cost of 1 gross.

$\$12 \div \$0.00288 = 4166\frac{2}{3}$, Ans.

5. $(14 \text{ rd.} + 12\frac{1}{2} \text{ rd.})$, or $26\frac{1}{2}$ rd., $\times 2 = 53$ rd.
53 rd. $= 874.5$ ft., length of fence.
$874.5 \times 5\frac{1}{2} = 4809\frac{3}{4}$ board ft.

$4809\frac{3}{4}$, or $4.809\frac{3}{4}$ M. $\times \$42 = \$202.0095$, Ans.

6. 10% of $\$280 = \$28$; $\$280 - \$28 = \$252$, cost.
$\$4.50 \times 72 = \$324$, what it was sold for.
Interest of $\$324$ for 93 d. at $6\% = \$5.02$, bank discount.
$\$324 - \$5.02 = \$318.98$, proceeds of note.

$\$318.98 - \$252 = \$66.98$, gain, Ans.

7.

$\left(\frac{1}{2}\right)^3 : 7^3 = 1\frac{3}{5} : x$, or $\frac{1}{8} : 343 = 1\frac{3}{5} : 4390\frac{3}{5}$ oz. $= 274\frac{3}{5}$ lb., Ans.

8. $27 \times 8 \times 125 = 27000$ cu. ft.

$\sqrt[3]{27000} = 30$ ft., length of 1 side.

$30 \text{ ft.}^2 = 900$ sq. ft., area of 1 side, Ans.

9. 16 cwt. 40 lb. $= \frac{41}{50}$ T.; $\frac{41}{50} \times 20 = 16\frac{2}{5}$ T. in 20 loads.

$\$35 \times 16\frac{2}{5} = \$574$, what was received for 20 loads.

$\$574 \times .08 = \$45.92$, interest for 1 year.

$\$35 \times 20 = \$700$, value of 20 T.

$\$700 - \$574 = \$126$, interest.

$\$126 \div \$45.92 = 2$ y. 8 mo. 28 d., Ans.

10. $\$4.50 \div \$0.50 = 9$, number of pounds.

18 ft. $\times$ 9 = 162 ft. = hypothenuse of triangle.

$162^2 - 56^2 = 26244 - 3136 = 23108$.

$\sqrt{23108} = 152+$ ft., height of the spire, Ans.

Article 458.

1. Whole number of sheep = 100%.

$\frac{4}{7}$ of 100% = $57\frac{1}{7}$% remaining; $4\% + 57\frac{1}{7}\% = 61\frac{1}{7}\%$.

$100\% - 61\frac{1}{7}\% = 38\frac{6}{7}\%$; 68 sheep = $38\frac{6}{7}$%.

$$\frac{68}{38\frac{6}{7}} \times 100 = 175 \text{ sheep, Ans.}$$

2. $256 \times 4 \times 5 = 5120$ cu. ft.; $5120 \div 128 = 40$ cords.

$\$152.56 \div 40 = \$3.81\frac{2}{5}$, cost of 1 cord, Ans.

3. $56 \times 85 = 4760$ sq. ft.; $14 \times \frac{1}{2} = 7$ bd. ft. in 1 board.

$4760 \div 7 = 680$ boards; $680 \times 8 = 5440$ nails.

$5440 \div 68 = 80$ pounds, Ans.

4. $6^2 = 36$; $8^2 = 64$; $36 + 64 = 100$.

$\frac{36}{100} = \frac{9}{25}$; $\frac{9}{25}$ of \$1000 = \$360, share of 1st.

$\frac{64}{100} = \frac{16}{25}$; $\frac{16}{25}$ of \$1000 = \$640, share of 2d.

5. $1200 \times .08 \times 1\frac{243}{360} = \$165.07$, simple interest.

Principal for 1st 6 mo.	\$1200.00
Interest " "	48.00
Principal for 2d 6 mo.	\$1248.00
Interest " "	49.92
Principal for 3d 6 mo.	\$1297.92
Interest " "	51.92
Principal for 2 mo. 19 d.	\$1349.84
Interest " "	23.69
Compound amount for 1 y. 8 mo. 19 d. . .	\$1373.53
Given principal	1200.00
Compound interest for 1 y. 8 mo. 19 d. . .	\$173.53

\$173.53 − \$165.07 = \$8.46, Ans.

6. $2304^2 = 5308416$ = the number.

$5'308'416\ (174.4+$

1

$10^2 \times 3$ =	300	4308
$10 \times 7 \times 3$ =	210	
7^2 =	49	
	559	3913
$170^2 \times 3$ =	86700	395416
$170 \times 4 \times 3$ =	2040	
4^2 =	16	
	88756	355024
$1740^2 \times 3$ =	9082800	40392000
$1740 \times 4 \times 3$ =	20880	
4^2 =	16	
	9103696	36414784
		3977216

7. $(1\frac{1}{2})^2 : \left(\frac{3}{4}\right)^2 = 3$ h. $: x$, or $\frac{9}{4} : \frac{9}{16} = 3$ h. $: x$

$\frac{\cancel{4}}{\cancel{9}} \times \frac{\cancel{9}}{\cancel{16}_{4}} \times 3 = \frac{3}{4}$ h., or 45 min., Ans.

8. \$ 1 − \$ 0.02 = \$ 0.98, cost of \$ 1 at sight.
\$ 1 × .0105 = \$ 0.0105, interest of \$ 1 for 63 d. at 6%.
\$ 0.98 − \$ 0.0105 = \$ 0.9695, cost of \$ 1 of exchange.

\$ 1939 ÷ \$ 0.9695 = \$ 2000, face of the draft, Ans.

9. \$ 508.50 × .01 × $2\frac{7}{36}$ = \$ $11.20\frac{9}{80}$, int. of \$ 508.50 at 1%

\$ $89.609 \div$ \$ $11.20\frac{9}{80} = 8$, or 8%, Ans.

10. $100\% + 4\frac{1}{2}\% = 104\frac{1}{2}\%$; \$ 7315 = $104\frac{1}{2}\%$.

$\frac{\$\,7315}{104\frac{1}{2}} \times 100 =$ \$ 7000, with which to buy apples.

\$ 7315 − \$ 7000 = \$ 315, commission.

$\frac{315}{6300} = \frac{1}{20}$; $\frac{1}{20}$ of $100\% = 5\%$, Ans.

Article 459.

1. \$ 10000 ÷ 1.05 = \$ $9523.80\frac{20}{21}$, par value.

\$ $9523.80\frac{20}{21} \times .05 =$ \$ $476.19\frac{1}{21}$, yearly income, Ans.

2. 1 section = 640 acres; 1 acre = 0.4047 Ha = 4047 ca.
4047 ca × 640 = 2590080 ca.

2590080 × \$ 1.50 = \$ 3885120, Ans.

3. 7912.5 × 3.1416 = 24857.91 mi., circumference of earth
24857.91 mi. ÷ 360 = $69.04\frac{38}{40}$ mi. in 1 degree.

$69.04\frac{38}{40}$ mi. ÷ 60 = $1.15\frac{1999}{2400}$ mi. in 1 minute, Ans.

4. A fraction is reduced to larger terms without changing the value. $\frac{2 \times 4 = 8}{3 \times 4 = 12}$, the multiplication increasing the number of fractional units 4 times, and making each one $\frac{1}{4}$ as large. Hence the value is not changed.

A fraction is reduced to smaller terms without changing the value. $\frac{8 \div 4 = 2}{12 \div 4 = 3}$, the division increasing the size of the fractional units 4 times, while their number is $\frac{1}{4}$ as large, so that the value is not changed.

5. 18 ft. $\times$ 15 ft. = 270 sq. ft. = 30 sq. yd.

27 in. $= \frac{27}{36} = \frac{3}{4}$ yd.; $30 \div \frac{3}{4} = 40$ yd.

$\$2.50 \times 40 = \$100$, Ans.

6. 70 min. $= 1\frac{1}{6}$ h.; 15° of longitude = 1 h. in time.

$1\frac{1}{6} \times 15° = 17.5°$ west, Ans.

120 min. = 2 h.; $2 \times 15° = 30°$ of longitude east, Ans.

7. $100\% + 16\frac{2}{3}\% = 116\frac{2}{3}\%$; $\$3000 = 116\frac{2}{3}\%$.

$\frac{\$3000}{116\frac{2}{3}} \times 100 = \$2571\frac{3}{7}$, cost of 1st farm.

$100\% - 12\% = 88\%$; $\$3000 = 88\%$.

$\frac{\$3000}{88} \times 100 = \$3409\frac{1}{11}$, cost of 2d farm.

$\$3000 + \$3000 = \$6000$, what both farms were sold for.

$\$2571\frac{3}{7} + \$3409\frac{1}{11} = \$5980\frac{4}{7}\frac{9}{7}$, what both farms cost.

$\$6000 - \$5980\frac{4}{7}\frac{9}{7} = \$19\frac{3}{7}\frac{7}{7}$, gain, Ans.

8. $\$960 \times 2 = \$1920$, annual income.

$\$1920 \div .04 = \$48000$, par value of stock.

$\$48000 \times 1.20 = \$57600$, amount to be invested, Ans.

9.

40 rd. square = 40 × 40 = 1600 sq. rd.

4 A. = 4 × 160 sq. rd. = 640 sq. rd.

20 rd. square = 20 × 20 sq. rd. = 400 sq. rd.

100 sq. rd. + 640 sq. rd. + 400 sq. rd. = 1140 sq. rd., what was sold.

1600 sq. rd. − 1140 sq. rd. = 460 sq. rd., Ans.

10. $\sqrt{21316} = 146$; $\sqrt[3]{150568768} = 532$.

$\frac{532}{146}$ of 100% = $364\frac{8}{73}$%, Ans.

Article 460.

1. 1 section = 1 sq. mi.; perimeter of 1 sq. mi. = 4 mi.

$4 \times 5280 \times \$0.12\frac{1}{2} = \$2640$, cost of fencing, Ans.

2. $40 \times \frac{3}{4} = 30$ sq. yd. = 270 sq. ft.

270 sq. ft. ÷ 18 ft. = 15 ft., width of room, Ans.

3.

$$\frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } 12\frac{4}{5}}{18\frac{1}{2} - 12\frac{8}{5}} = \frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } \frac{112}{9}}{18\frac{9}{18} - 12\frac{16}{18}} = \frac{\frac{110}{21}}{\frac{101}{18}} = \frac{\overset{20}{\cancel{140}}}{\underset{7}{\cancel{21}}} \times \frac{\overset{6}{\cancel{18}}}{101} = \frac{120}{101} =$$

$1\frac{19}{101}$, Ans.

4. 12 cd. = 12 × 128 cu. ft. = 1536 cu. ft.

9 ft. × 6 ft. = 54 sq. ft.

1536 ÷ 54 = $28\frac{4}{9}$ ft., length of the pile, Ans.

5. $45 \times 30 = 1350$ yd.; $\$3.75 \times 1350 = \$5062.50$, cost.

$\$1 \times .06 \times \frac{3}{4} = \$0.045$; $\$1 + \$0.045 = \$1.045$.

$\$5062.50 \div 1.045 = \$4844.50$, present worth of $\$5062.50$.

$\$4 \times 1350 = \$5400$, what it was sold for.

$\$1 \times .06 \times \frac{1}{3} = \$0.02$; $\$1 + \$0.02 = \$1.02$.

$\$5400 \div 1.02 = \$5294.12$, present worth of $\$5400$.

$\$5294.12 - \$4844.50 = \$449.62$, gain, Ans.

6. 4 mo. 3 d. after June 15 = Oct. 18, date when due.

From Aug. 18 to Oct. 18 = 61 d., term of discount.

Int. of $\$4500$ for 61 d. at $7\frac{1}{2}\%$ = $\$57.18\frac{3}{4}$, bank discount.

$\$4500 - \$57.18\frac{3}{4} = \$4442.81\frac{1}{4}$, proceeds, Ans.

7. $\$1 \times .04 \times 3\frac{3}{4} = \$0.15$.

$\$1 + \$0.15 = \$1.15$, amount of $\$1$ for 3 y. 9 mo. at 4 %.

$\$520 \div 1.15 = \$452.17\frac{8}{23}$, principal, Ans.

8. $\left.\begin{matrix} 24 : 16 \\ 9 : 12 \\ 15 : 45 \\ 8 : 9 \\ 3 : 6 \end{matrix}\right\} = 6 : x$ $\quad \frac{\overset{2}{\cancel{16}} \times \overset{4}{\cancel{12}} \times \overset{3}{\cancel{45}} \times 9 \times 6 \times 6}{\underset{3}{\cancel{24}} \times 9 \times \underset{2}{\cancel{15}} \times \cancel{8} \times \cancel{3}} =$ 36 men, Ans.

9. 1 section of land = 1 sq. mi.; 1 sq. mi. is 320 rd. long.

$320^2 + 320^2 = 102400 + 102400 = 204800$.

$\sqrt{204800} = 452.54$ rd. diagonal.

$\frac{452.54}{2} = 226.27$ rd. from the centre to each corner, Ans.

10. 24 ft. 6 in. $= 24\frac{1}{2} = \frac{49}{2}$ ft.; 20 ft. 9 in. $= 20\frac{3}{4} = \frac{83}{4}$ ft.

8 in. $= \frac{2}{3}$ ft.

$\frac{49 \times 83 \times \overset{2}{\cancel{2}}}{\underset{2}{\cancel{2}} \times 4 \times 3} = \frac{4067}{12} = 338\frac{11}{12}$ cu. ft., Ans.

Article 461.

1. 93 d. = term of discount.
Bank discount of \$1 for 93 d. at 8% = \$0.0206⅔.
Proceeds of \$1 = \$1 − \$0.0206⅔ = \$0.9793⅓.
\$850 ÷ \$0.9793⅓ = \$867.94, face of note, Ans.

\$867$\frac{94}{100}$. *March 30, 1891.*

Ninety days after date I promise to pay to the order of Wm. White, eight hundred sixty-seven $\frac{94}{100}$ dollars. Value received.

JOHN SMITH.

2.

$$3\tfrac{1}{8} \div .31 = \frac{\cancel{31}}{\cancel{8}_{2}} \times \frac{\overset{25}{\cancel{100}}}{\cancel{31}} = 12\tfrac{1}{2}; \quad .31 \div 3\tfrac{1}{8} = \frac{\cancel{31}}{\cancel{100}_{25}} \times \frac{\overset{2}{\cancel{8}}}{\cancel{31}} = \frac{2}{25};$$

$$12\tfrac{1}{2} - \frac{2}{25} = 12\tfrac{21}{50}, \text{ Ans.}$$

3.

100% + 25% = 125%; \$46 = 125% of the cost.

$\frac{\$46}{125} \times 100 = \$36.80$, cost per ton. 100% + 18¼% = 118¼%.

118¼% of \$36.80 = \$43.516, Ans.

4. 80 ft. square = 80 × 80 = 6400 sq. ft.
6400 sq. ft. × 12 = 76800 sq. ft. in 12 lots.
76800 sq. ft. = $1\frac{777}{3630}$ acres.

\$50 × $1\frac{777}{3630}$ = \$$88\frac{528}{3630}$, Ans.

5. 348 ÷ 2 = 174 leaves in one book.
32 × 174 = 5568 leaves in thirty-two books.
1 sheet makes eight octavo leaves.
5568 ÷ 8 = 696 sheets required.

696 ÷ 480 = $1\frac{9}{20}$ reams, Ans.

6. $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$; $\$720 = 102\frac{1}{2}\%$.

$\frac{\$720}{102\frac{1}{2}} \times 100 = \$702.43\frac{7}{41}$, amount expended.

$\$702.43\frac{7}{41} \div \$0.37 = 1898\frac{734}{1517}$ lb., Ans.

7. $5 \div 3 = 1\frac{2}{3}$.

B does $1\frac{2}{3}$ times as much business as A, and hence has the opportunity to make 7% on his capital $1\frac{2}{3}$ times while A is making 9% on his capital once. $1\frac{2}{3} \times 7\% = 11\frac{2}{3}\%$, B's gain. 9%, A's gain. $11\frac{2}{3}\% - 9\% = 2\frac{2}{3}\%$ = gain of B more than A, or $\$26\frac{2}{3}$ on $\$1000$ capital.

8. 48 ft. $\times 3.1416 = 150.7968$ ft. of fence.

$\frac{150.7968 \text{ ft.}}{4} = 37.6992$ ft. on 1 side of square.

$37.6992^2 = 1421.2296$ sq. ft., area of square field.

9. $\$325.50 \times .01 \times 3\frac{2}{3} = \$11.067$, interest at 1%.

$\$77.469 \div \$11.067 = 7$, or 7%.

$\$1.80 \times .01 \times 3\frac{2}{3} = \$0.0612$, interest of $\$1.80$ at 1%.

$\$2.259 - \$1.80 = \$0.459$.

$\$0.459 \div \$0.0612 = 7\frac{1}{2}$, or $7\frac{1}{2}\%$; $7\frac{1}{2}\% - 7\% = \frac{1}{2}\%$.

Hence B receives $\frac{1}{2}\%$ more, Ans.

10. $\sqrt{.0064} = .08$; $\sqrt[3]{.0064} = .185+$.

$.185+ - .08 = .105+$, Ans.

Article 462.

1. $13\frac{2}{3} : 37\frac{7}{8} = \$11.75 : x$

$\frac{3 \times 303 \times 11.75}{41 \times 8} = \$32.56\frac{107}{328}$, Ans.

2. $80 \times 20 \times 2\frac{1}{4} = 3600$ cu. ft. $= 6220800$ cu. in.
$10 \times 9 \times 4 = 360$ cu. in. in 1 stone.

$$6220800 \div 360 = 17280 \text{ stones, Ans.}$$

3. $12\frac{1}{2} : 15 = \$4.20 : x$

$$\frac{\overset{3}{2} \times \cancel{15} \times \overset{84}{\cancel{4.20}}}{\cancel{5}} = \$5.04, \text{ Ans.}$$

4. $7\frac{1}{8}\%$ of $\$250 = \$19.06\frac{1}{4}$.
$\$250 + \$19.06\frac{1}{4} = \$269.06\frac{1}{4}$, cost of 1 share.

$$25 \times \$269.06\frac{1}{4} = \$6726.56\frac{1}{4}, \text{ Ans.}$$

5. Interest of $\$840$ for 4 mo. 3 d. at $6\% = \$17.22$.
Hence the note should be sold for $\$17.22$ less than its face.

6. $25^2 - 15^2 = 625 - 225 = 400$.
$\sqrt{400} = 20$ yd., perpendicular of triangle.
$\frac{20 \text{ yd.} \times 15 \text{ yd.}}{2} = 150$ sq. yd. $= 1350$ sq. ft.

$$\$0.08\frac{1}{3} \times 1350 = \$112.50, \text{ Ans.}$$

7.

$35 \times 30 \times 12 = 12600$ cu. ft.; 40×10 cu. ft. $= 400$ cu. ft.

$$12600 \div 400 = 31\frac{1}{2} \text{ minutes, Ans.}$$

8. 4832 lb. $+ 4628$ lb. $+ 4976$ lb. $= 14436$ lb.
1124 lb. $+ 1136$ lb. $+ 1142$ lb. $= 3402$ lb.
14436 lb. $- 3402$ lb. $= 11034$ lb., net weight.
11034 lb. $= 5.517$ T.

$$\$33.37\frac{1}{2} \times 5.517 = \$184.129\frac{7}{8}, \text{ Ans.}$$

9. $\$1.20 \times 4000 = \$4800$, value of the wheat.

$\frac{2}{3}$ of $\$4800 = \$3200$, value insured; $\frac{3}{4}$ of $1\frac{1}{2}\% = 1\frac{1}{8}\%$.

$\$3200 \times .01\frac{1}{8} = \$36$, premium.

$\$4800 - \$3200 = \$1600$.

$\$1600 + \$36 = \$1636$, Ans.

10.

Principal	$6000.00
Int. from Oct. 1, 1889, to Jan. 1, 1890, 3 mo.	120.00
Amount	$6120.00
1st payment	500.00
New principal	$5620.00
Int. from Jan. 1, 1890, to Sept. 10, 1890, 8 mo. 9 d.	310.97
Amount	$5930.97
2d payment	1126.00
New principal	$4804.97
Int. from Sept. 10, 1890, to Mar. 31, 1891, 6 mo. 21 d.	214.62
Amount	$5019.59
3d payment	2000.00
New principal	$3019.59
Int. from Mar. 31, 1891, to Aug. 10, 1891, 4 m. 10 d.	87.23
Amount	$3106.82
4th payment	876.50
New principal	$2230.32
Int. from Aug. 10, 1891, to Oct. 1, 1895, 4 y. 1 m. 21 d.	738.98
Amount due Oct. 1, 1895 Ans.	$2969.30

Article 463.

1. 70 rd. $5\frac{1}{2}$ ft. $= 1160\frac{1}{2}$ ft.; 52 rd. $8\frac{1}{4}$ ft. $= 866\frac{1}{4}$ ft.

$1160\frac{1}{2}$ ft. $\times$ $866\frac{1}{4}$ ft. $= 1005283\frac{1}{8}$ sq. ft.

$1005283\frac{1}{8}$ sq. ft. $= 23\frac{5}{6}\frac{5}{4}$ acres.

$\$256 \times 23\frac{5}{6}\frac{5}{4} = \$5908$, Ans.

2.

$2)\$725$ = Principal.
3.625 = 1 month's interest.
$9\frac{2}{15}$ = Time in months.
32625
$483\frac{1}{3}$
$\$33.108$ = Interest at 6%.
5.518 = " " 1%.
$\$27.590$ = " " 5%.

3.

600
600 × 6 mo. = 3600 mo.
600 × 12 " = 7200 "
600 × 18 " = 10800 "
600 × 24 " = 14400 "
600 × 30 " = 18000 "
600 × 36 " = 21600 "
4200) 75600 mo.
18 mo., equated time, Ans.

4.

$5 \times 5 \times 50 = 1250$ cu. ft., contents of chimney if solid.
$1 \times 1 \times 50 \times 2 = 100$ cu. ft., contents of the two flues.
1250 cu. ft. − 100 cu. ft. = 1150 cu. ft., contents of bricks used.
$1728 \div (8 \times 4 \times 2) = 27$ bricks in a cubic foot.

1150×27 bricks = 31050 bricks in chimney, Ans.

5. $100\% - 20\% = 80\%$; $\$250 = 80\%$.

$\frac{\$250}{80} \times 100 = \$312.50$, cost of the carriage, Ans.

6. $12^2 + 5^2 = 144 + 25 = 169$.

$\sqrt{169} = 13$ ft., hypothenuse of triangle.
13 ft. = diameter of the wheel.

13 ft. × 3.1416 = 40.8408 ft., Ans.

7. C's 9 sheep = 3 cows; 3 cows + 4 cows = 7 cows.
D's 42 sheep = 14 cows.

A's 7 cows for 6 weeks = 42 cows for 1 week.
B's 3 cows for 13 weeks = 39 " " "
C's 7 cows for 7 weeks = 49 " " "
D's 14 cows for 5 weeks = 70 " " "
The entire number = 200 " " "

$\frac{42}{200}$ of \$ 75 = \$ 15.75, A's share.

$\frac{39}{200}$ of \$ 75 = \$ 14.62½, B's share.

$\frac{49}{200}$ of \$ 75 = \$ 18.37½, C's share.

$\frac{70}{200}$ of \$ 75 = \$ 26.25, D's share.

8. B has \$ 250 more than C.
A has \$ 250 + \$ 50 = \$ 300 more than C.
\$ 250 + \$ 300 = \$ 550; \$ 3000 − \$ 550 = \$ 2450.
$\frac{1}{3}$ of \$ 2450 = \$ 816⅔, C's share.
\$ 816⅔ + \$ 250 = \$ 1066⅔, B's share.
\$ 816⅔ + \$ 300 = \$ 1116⅔, A's share.

9.

$$80 : 1280 = 6^3 : x^3 \qquad \frac{1280 \times 216}{80} = \sqrt[3]{3456} = 15.12 - \text{ft. } \textit{Ans.}$$

16

10. A can do the work in $\frac{5}{6}$ hour = 50 minutes. He can do $\frac{1}{50}$ in 1 minute.

B can do $\frac{5}{6}$ of the work in 1 hour, or 60 minutes. In one minute he can do $\frac{1}{60}$ of $\frac{5}{6}$ of the work, or $\frac{1}{72}$.

$\frac{1}{50} + \frac{1}{72} = \frac{61}{1800}$, A and B can do in 1 minute.

To do $\frac{1800}{1800}$, or the whole work, it will take

$$\frac{1800}{1800} \div \frac{61}{1800} = 29\tfrac{31}{61} \text{ minutes, Ans.}$$

Article 466.

1. 39.
2. 83.
3. 419.
4. 11222.
5. 2544.
6. 1898.
7. XXIX.
8. LXXIII.
9. XCVIII.
10. CLXI.
11. MDLXXX.
12. MMDCCC.
13. MDCCLXXVI.

Article 474.

16.

$0.\dot{7}5\dot{3} = \frac{753}{999} = \frac{251}{333}$, Ans.

17.

$0.\dot{5}9\dot{4} = \frac{594}{999} = \frac{22}{37}$, Ans.

18. $0.4\dot{2}\dot{5} = \frac{421}{990} = \frac{421}{99} \times \frac{1}{10} = \frac{421}{990}$, Ans.

19. $7.34\dot{5} = 7\,\frac{345}{100} = 7\tfrac{311}{900} = \frac{6611}{900}$, Ans.

20. $0.\dot{1}3\dot{5} = \frac{135}{999} = \frac{5}{37}$, Ans.

21. $53.00\dot{2}4\dot{3} = 53\frac{\frac{243}{999}}{100} = 53\frac{243}{99900} = \frac{196109}{3700}$, Ans.

22. $29.25\dot{9} = 29\frac{\frac{259}{9}}{100} = 29\frac{26}{100}$; $25.\dot{0}4\dot{7} = 25\frac{47}{999}$.

$$29\frac{26}{100} - 25\frac{47}{999} = 4\frac{2312}{99900} = 4.21\dot{2}9\dot{5}, \text{ Ans.}$$

23. $5.9 = 5\frac{9}{10} = \frac{59}{10}$; $0.\dot{0}\dot{8} = \frac{8}{99}$.

$$\frac{59}{\cancel{10}_{5}} \times \frac{\overset{4}{\cancel{8}}}{99} = \frac{236}{495} = .4\dot{7}\dot{6}, \text{ Ans.}$$

24. $4.2\dot{7} = 4\frac{27}{10} = 4\frac{5}{18} = \frac{77}{18}$; $0.\dot{4}\dot{2} = \frac{42}{99} = \frac{14}{33}$.

$$\frac{77}{18} \div \frac{14}{33} = \frac{\overset{11}{\cancel{77}}}{\underset{6}{\cancel{18}}} \times \frac{\overset{11}{\cancel{33}}}{\underset{2}{\cancel{14}}} = \frac{121}{12} = 10.08\dot{3}, \text{ Ans.}$$

Article 478.

25. 120 ch. 75 li. = 120.75 ch.

120.75 ch. ÷ 80 = 1.509375 miles, Ans.

26. 30 ch. 25 li. = 30.25 ch.; 25 ch. 40 li. = 25.40 ch.
30.25 × 25.40 = 768.35 sq. ch.

768.35 sq. ch. ÷ 10 = 76.835 acres, Ans.

27. 14 ch. 50 li. = 14.5 ch.; 24 ch. 20 li. = 24.2 ch.
$\frac{14.5 \times 24.2}{2} = 175.45$ sq. ch.

175.45 sq. ch. ÷ 10 = 17.545 acres, Ans.

28. $500 \times 1.15 = 575$ miles, Ans.

29. 1 ℔ 8 ℥ 2 ʒ $= 9720$ gr.; $9720 \div 20 = 486$, Ans.

30. $60 \times 8 = 480$ m.; 480 m. $\times 12 = 5760$ m., Ans.

31.

20000 lb. $\div 56 = 357\frac{1}{7}$ bu.; \$0.63 $\times 357\frac{1}{7} =$ \$225, Ans.

32. \$19.50 $\times 4 =$ \$78, cost; 200 lb. $\times 4 = 800$ lb.
\$0.14 $\times 800 =$ \$112, what it was sold for.

\$112 $-$ \$78 $=$ \$34, gain, Ans.

Article 481.

33. 22, Ans.

34.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Article 486.

36. $15)\ 77^\circ\ 2'\ 48''$

5 h. 8 min. $11\frac{1}{5}$ sec., Ans.

37.

	2°	20′	15″
	71	4	9
15)	73°	24′	24″, difference of longitude.

4 h. 53 min. 37⅜ sec., difference of time.

6

10 h. 53 min. 37⅜ sec., A. M., Ans.

38. 49 min. 48$\frac{4}{11}$ sec.

15

12° 27′ 14″, Ans.

39. 53 min. 30 sec.

15

13° 22′ 30″, Ans.

40.

1 h. 35 min. 20 sec.

15

23°	50′	0″
69	50	
93°	40′, west, Ans.	

Article 493.

44. From Jan. 1, 1890, to Apr. 1, 1894, = 4 y. 3 mo.

Principal	$600.00		
1st annual interest		$36.00	
Int. on 1st annual int. 3 y. 3 mo.			$7.02
2d annual interest		36.00	
Int. on 2d annual int. 2 y. 3 mo.			4.86
3d annual interest		36.00	
Int. on 3d annual int. 1 y. 3 mo.			2.70
4th annual interest		36.00	
Int. on 4th annual int. 3 mo.			0.54
5th annual interest		9.00	
	$600.00	$153.00	$15.12
Total interest, $153 + $15.12	168.12		
Amount due	$768.12, Ans.		

45

From May 16, 1891, to Mar. 16, 1894, = 2 y. 10 mo.

Principal	$1250.00		
1st annual interest		$62.50	
Int. on 1st annual int. 1 y. 10 mo. .			$5.73
2d annual interest		62.50	
Int. on 2d annual int. 10 mo. . . .			2.60
3d annual interest		52.08	
	$1250.00	$177.08	$8.33
Total interest, $177.08 + $8.83 . .	185.41		
Amount due	$1435.41, Ans.		

46.

From Mar. 14, 1890, to Sept. 25, 1893, = 3 y. 6 mo. 11 d.

Principal	$576.00		
1st annual interest		$34.56	
Int. on 1st annual int. 2 y. 6 mo. 11 d. .			$5.25
2d annual interest		34.56	
Int. on 2d annual int. 1 y. 6 mo. 11 d. .			3.17
3d annual interest		34.56	
Int. on 3d annual int. 6 mo. 11 d. . .			1.10
4th annual interest		18.34	
	$576.00	$122.02	$9.52
Total interest, $122.02 + $9.52 . .	131.54		
Amount due	$707.54, Ans.		

Article 494.

48.

Principal drawing int. from April 1, 1883		$2000 00		
1st annual int. due April 1, 1884			$120.00	
Interest on same (2 years)				$14.40
2d annual int. due April 1, 1885			120.00	
Interest on same (1 year)				7.20
3d annual int. due April 1, 1886			120.00	
Amount due April 1, 1886		$2000.00	+ $360.00	+ $21.60
1st payment Sept. 19, 1885	$500.00			
Interest on same to April 1, 1886 (6 mo. 13 d.)	16.08			
Amount of pay't to April 1, 1886	$516.08	= 134.48	+ 360.00	+ 21.60
Prin. drawing int. fr. Apr. 1, 1886		$1865.52		
4th annual int. due April 1, 1887			$111.93	
Interest on same (3 years)				$20.15
5th annual int. due April 1, 1888			111.93	
Interest on same (2 years)				12.43
6th annual int. due April 1, 1889			111.93	
Interest on same (1 year)				6.72
7th annual int. due April 1, 1890			111.93	
Amount due April 1, 1890		$1865.52	+ $447.72	+ $39.30
2d payment, Dec. 3, 1889	600.00			
Interest on same to April 1, 1890 (3 mo. 29 d.)	11.90			
	$611.90	= 124.88	+ 447.72	+ 39.30
Prin. drawing int. fr. Apr. 1, 1890		$1740.64		
8th annual int. due April 1, 1891			$104.44	
Amount due April 1, 1891		$1740.40	+ $104.44	
3d payment, Aug. 9, 1890	775.00			
Interest on same to April 1, 1891	30.10			
	$805.10	= 700.66	+ 104.44	
Principal on int. fr. Apr. 1, 1891		$1039.98		
9th annual int. due April 1, 1892			$62.40	
Interest on same (1 y. 1 m. 18 d.)				$4.24
10th annual int. due Apr. 1, 1893			62.40	
Interest on same (1 m. 18 d.)				0.50
Final int. on principal to May 19 (1 mo. 18 d.)			8.32	
Amount due May 19, 1893	$1177.84	= $1039.98	+ $133.12	+ $4.74

49.

Principal on int. fr. Jan. 13, 1884		$5000.00		
1st annual int. due Jan. 13, 1885			$300.00	
Int. on same to Jan. 13, '89 (4 y.)				$72.00
2d annual int. due Jan. 13, 1886			300.00	
Int. on same to Jan. 13, '89 (3 y.)				54.00
3d annual int. due Jan. 13, 1887			300.00	
Int. on same to Jan. 13, '89 (2 y.)				36.00
4th annual int. due Jan. 13, 1888			300.00	
Int. on same to Jan. 13, '89 (1 y.)				18.00
5th annual int. due Jan. 13, 1889			300.00	
Amount due Jan. 13, 1889....		$5000.00	+ $1500.00	+ $180.00
1st payment, Sept. 23, 1888...	$2000.00			
Interest on same to Jan. 13, 1889 (3 mo. 21 d.).....	37.00			
Amount of pay't Jan. 13, 1889	$2037.00	= 357.00	+ 1500 00	+ 180.00
New prin. on int. fr. Jan. 13, '89		$4643.00		
6th annual int. due Jan. 13, 1890			$278.58	
Interest on same to Jan. 13, 1891				$16.71
7th annual int. due Jan. 13, 1891			278.58	
Amount due Jan. 13, 1891.....		$4643.00	+ $557.16	+ $16.71
2d payment Feb. 19, 1890.....	1500.00			
Int. on same to Jan. 13, 1891 (10 mo. 25 d.).....	81.25			
	$1581.25	= 1007.38	+ 557.16	+ 16.71
New prin. on int. fr. Jan. 13, '91		$3665.62		
8th annual int. due Jan. 13, 1892			$218.14	
3d payment, May 29, 1891, there being nothing but annual int. due, draws no int. but goes to cancel annual int. due.....			125.00	
Balance of 8th annual interest due Jan. 13, 1892.....			$93.14	
Int. on same to Jan. 13, '94 (2 y.)				$11.18
9th annual int. due Jan. 13, 1893			218.14	
Int. on same to Jan. 13, '94 (1 y.)				13.09
Amount due, Jan. 13, 1894....		$3665.62	+ $529.42	+ $24.27
4th payment, June 11, 1893...	20.00			
Interest on same to Jan. 13, '94 (7 mo. 2 d.).....	0.71			
	$20.71			

Amount brought forward.....	$3665.62 +	$529.42 +	$24.27
Amount of 4th payment, which goes to cancel int. on annual int.			20.71
Bal. of simple int. due Jan. 13, '94			$3.56
Unchanged principal.....	$3665.62		
Accrued annual interest.....		$529.42	
Interest on same to settlement (1 y. 7 mo. 17 d.).....			51.80
11th annual int. due Jan. 13, '95		218.14	
Interest on same to settlement (7 mo. 17 d.).....			8.25
Int. of principal from Jan. 13, '95, to settlement (7 mo. 17 d.).....		137.54	
Amount due at settlement.....	$4584.33 = $3665.62 +	$885.10 +	$63.61

Article 497.

51.

Debits.		*Credits.*	
July 10, 149 × 0 d. =	0 d.	July 15, 650 × 5 d. =	3250 d.
" 20, 601 × 10 d. =	6010 d.		
$750	6010 d.	$650	3250 d.
650			
$100, balance	3250 d.		
	2760 d.		

$2760 \div 100 = 27\frac{3}{5} = 28$ days.

July 10, 1891, + 28 d. = Aug. 7, 1891, average time, Ans.

52.

Debits.		*Credits.*	
Oct. 30, 550 × 0 d. =	0 d.	Oct. 31, 400 × 1 d. =	400 d.
Nov. 14, 850 × 15 d. =	12750 d.	Nov. 4, 30 × 5 d. =	150 d
$1400	12750 d.	$430	550 d.
430	550 d.		
$970, balance	12200 d.		

$12200 \div 970 = 12\frac{440}{970} = 13$ days.

Oct. 30, 1891, + 13 d. = Nov. 12, 1891, average time, Ans.

53.

Debits.		*Credits.*	
Mar. 2, 600 × 0 d. =	0 d.	Mar. 14, 400 × 12 d. =	4800 d.
$600	0 d.	$400	4800 d.
400			0 d.
$200, balance.			4800 d.

4800 ÷ 200 = 24 days.

Mar. 2 — 24 d. = Feb. 6, average time, Ans.

54.

Debits.		*Credits.*	
1881.		1881.	
Sept. 1, 150 × 0 d. =	0 d.	Sept. 11, 60 × 10 d. =	600 d.
Dec. 10, 200 × 100 d. =	20000 d.	Dec. 10, 140 × 100 d. =	14000 d.
1882.		1882.	
Feb. 28, 200 × 180 d. =	36000 d.	Jan. 29, 100 × 150 d. =	15000 d.
$550	56000 d.	$300	29600 d.
300	29600 d.		
$250, balance.	26400 d.		

26400 d. ÷ 250 = 105⅔ = 106 days.

Sept. 1, 1891, + 106 d. = Dec. 16, 1891, average time, Ans.

Article 505

56. $2545 × $0.012 = $30.54, B's tax on property.
$30.54 + $1.75 = $32.29, B's entire tax.

57. $9565 × $0.012 = $114.78, C's tax on property.
$114.78 + $1.50 = $116.28, C's entire tax.

$1764 × $0.012 = $21.168, D's tax on property.
$21.168 + $1.50 = $22.668, D's entire tax.

$5630 × $0.012 = $67.56, E's tax on property.
$67.56 + $1.50 = $69.06, E's entire tax.

58.

$1 \times 600 = \$600$.

$\$600 + \$348 = \$948$, sum to be assessed on the polls.

$\$948 \div 600 = \$1.58$, to be assessed on each poll.

$\$348 + \$1500 + \$12100 = \$13948$, entire tax.

$\$13948 - \$948 = \$13000$, to be assessed on the property.

$\$1500 - \$600 = \$900$, of the county tax to be assessed on the property.

$\$900 \div \$1000000 = 0.0009$, rate of taxation for county tax.

$\$12100 \div \$1000000 = 0.0121$, rate of taxation for town tax.

$\$5000 \times 0.0009 = \$4.50$, A's county tax on property.

$\$4.50 + \$1 = \$5.50$, A's entire county tax.

$\$5000 \times 0.0121 = \$60.50$, A's town tax.

$\$5.50 + \$60.50 + \$0.58 = \$66.58$, A's entire tax.

Article 510.

59. £ 725 3 *s.* 4 *d.* = £ $725\frac{1}{6}$.

$\$4.866\frac{1}{2} \times 725\frac{1}{6} = \$3529.02\frac{43}{120}$.

$\$4 \times 200 = \$800$, duty.

$\$3529.02\frac{43}{120} + \$800 = \$4329.02\frac{43}{120}$, Ans.

60. $2664.5 \times 6 = 15987$ francs.

$\$0.193 \times 15987 = \$3085.491$.

$\$3085.491 \times .50 = \$1542.7455$, Ans.

61. 36 lb. $\times$ 7880 = 283680 lb.

$283680 \times .01\frac{1}{2} = 4255.20$.

$\$4255.20$, Ans.

63. $640.4 \times 2.05 = 1312.82$ marks.

$100\% - 8\% = 92\%$; $1312.82 \times .92 = 1207.7944$.

$\$0.238 \times 1207.7944 = \$287.455$.

$\$287.455 \times .40 = \$114.982+$, ad valorem duty, Ans.

NOTE. — The rate of duty used in working problem 63, is that on women's and children's dress goods, valued at not over fifty cents per pound, tariff of 1894.

Article 514.

64. $\frac{1}{4}$ of 42 in. $= 10.5$ in.; $10.5^2 = 110.25$.

$30 \times 110.25 = 3307.5$.

$3307.5 \div 144 = 22\frac{3}{9}\frac{1}{3} = 22.96+$ cu. ft., Ans.

65. $\frac{1}{4}$ of 60 in. $= 15$ in.; $15^2 = 225$.

$24 \times 225 = 5400$.

$5400 \div 144 = 37\frac{1}{2}$ cu. ft., Ans.

Article 515.

66. 21 in. $\times$ 0.707 = 14.847 in., Ans.

67. 24 in. $\times$ 0.707 = 16.968 in. = 1.414 ft.

18 ft. $\times$ 1.414 ft. $\times$ 16.968 in. = 431.869536 bd. ft., Ans

68. 6 ft. = 72 in.; 72 in. $\div$ 3.1416 = 22.918 in. = diameter.

22.918+ $\times$ 0.707 = 16.20+ in. = side.

16.20 $\div$ 12 = 1.35 ft.

20 ft. $\times$ 1.35 ft. $\times$ 16.20 in. = 437.4 bd. ft.

437.4 bd. ft. = 0.4374 thousand ft.

$\$30 \times 0.4374 = \$13.122$, Ans.

Article 518.

69. $22^2 = 484$; $484 \times 30 = 14520$.

$14520 \times 0.0034 = 49.36\frac{4}{5}$ gal., Ans.

70. $30^2 = 900$; $900 \times 38 = 34200$.

$34200 \times 0.0034 = 116.28$ gal., Ans.

71. 30 in. $-$ 24 in. $= 6$ in.; $6 \times 0.7 = 4.2$ in.
$24 + 4.2 = 28.2$, mean diameter.
28.2^2, or 795.24, $\times$ 36 $= 28628.64$.

$28628.64 \times 0.0129 = 369.309456$ liters, Ans.

72. 4 ft. 3 in. $= 4.25$ ft.; 3 ft. 6 in. $= 3.5$ ft.
$4.25 \times 3.5 \times 4 = 59.5$ cu. ft.
1 cu. ft. $= 7\frac{1}{2}$ gal.

$59.5 \times 7\frac{1}{2} = 446.25$ gal., Ans.

Article 520.

73. $\frac{3}{5}$ of $\overset{4}{20}$ ft. $= 12$ ft.; 75 ft. $-$ 12 ft. $= 63$ ft.
$63 \times 20 \times 9 = 11340$.

$11340 \div 95 = 119\frac{7}{19}$ tons, Ans.

74. $\frac{3}{5}$ of $\overset{6}{30}$ ft. $= 18$ ft.; 160 ft. $-$ 18 ft. $= 142$ ft.
$142 \times 30 \times 15 = 63900$.

$63900 \div 95 = 672\frac{12}{19}$ tons, Ans.

Article 526.

75. 8 ft. $\times$ 4 ft. $\times$ 3 ft. $= 96$ cu. ft.

96 cu. ft. $\div 1\frac{1}{4} = 76\frac{4}{5}$ bu., Ans.

76. $8 \times 3\frac{1}{2} \times 2 = 56$ cu. ft.

$56 \div 1\frac{1}{4} = 44\frac{4}{5}$ bu. corn in the ear.

$44\frac{4}{5} \div 2 = 22\frac{2}{5}$ bu. shelled corn, **Ans.**

77. 1200 lb. $\div$ 100 lb. $= 12$.

3 lb. $\times$ 12 $=$ 36 lb. per day each.

$36 \times 3 \times 120 = 12960$ lb.

$\frac{2}{3}$ of 12960 lb. $=$ 8640 lb., **Ans.**

78. 1 bbl. flour $=$ 196 lb.

Since 33 lb. less $\frac{1}{6} = 1$ bu. wheat,

$196 \div 33 = 5\frac{31}{33}$ bu., **Ans.**

79 56 lb. corn $=$ 100 lb. meadow hay.

1 ton $=$ 2000 lb.; 2000 lb. $\div$ 100 lb. $= 20$.

100 lb. hay cost \$ 0.75.

\$ 0.75 $\times$ 20 $=$ \$ 15, cost per ton, **Ans.**

80. $\frac{3}{5}$ of $\overset{310}{\cancel{1550}}$ lb. $=$ 930 lb., net weight.

$\frac{1}{5}$ of 930 lb. $=$ 186 lb., rump and sirloin.

186 lb. round, **Ans.**

81. $\frac{4}{5}$ of $\overset{450}{\cancel{2250}}$ lb. $=$ 1800 lb., net weight.

$\frac{1}{4}$ of 1800 lb. $=$ 450 lb., hams and shoulders.

$\frac{1}{3}$ of 1800 lb. $=$ 600 lb., clear pork, **Ans.**

Article 532.

82. 900 sq. ft. $\div$ 9 = 100 sq. yd.

100 $\div$ 35 = $2\frac{6}{7}$ casks lime.

\$0.90 $\times$ $2\frac{6}{7}$ = \$$2.57\frac{1}{7}$, cost of lime.

10 $\times$ $2\frac{6}{7}$ = $28\frac{4}{7}$ bu. of sand.

\$0.08 $\times$ $28\frac{4}{7}$ = \$$2.28\frac{4}{7}$, cost of sand.

5 $\times$ $2\frac{6}{7}$ = $14\frac{2}{7}$ lb. of hair.

\$0.06 $\times$ $14\frac{2}{7}$ = \$$0.85\frac{5}{7}$, cost of hair.

\$$2.57\frac{1}{7}$ + \$$2.28\frac{4}{7}$ + \$$0.85\frac{5}{7}$ = \$$5.71\frac{3}{7}$, Ans.

83. 224 $\times$ 4 = 896 sq. ft.; 896 sq. ft. $\div$ 9 = $99\frac{5}{9}$ sq. yd.

$99\frac{5}{9}$ $\times$ 40 = $3982\frac{2}{3}$ bricks.

$3982\frac{2}{3}$ $\div$ 1000 = $3.982\frac{2}{3}$ thousand bricks.

\$7.50 $\times$ $3.982\frac{2}{3}$ = \$$29.86\frac{2}{3}$, cost of bricks.

$99\frac{5}{9}$ $\div$ 20 = $4\frac{14}{18}$ days' work.

\$2.75 $\times$ $4\frac{14}{18}$ = \$$13.68\frac{8}{9}$, mason's bill.

\$1.50 $\times$ $4\frac{14}{18}$ = \$$7.46\frac{2}{3}$, helper's bill.

\$$29.86\frac{2}{3}$ + \$$13.68\frac{8}{9}$ + \$$7.46\frac{2}{3}$ = \$$51.02\frac{2}{9}$, Ans.

84. 40 $\times$ 24 = 960 sq. ft. = $106\frac{2}{3}$ sq. yd.

1 cask will concrete 9 sq. yd.

$106\frac{2}{3}$ $\div$ 9 = $11\frac{23}{27}$ casks of cement.

\$2 $\times$ $11\frac{23}{27}$ = \$$23.70\frac{10}{27}$, cost of cement.

12 bu. $\times$ $11\frac{23}{27}$ = $142\frac{2}{3}$ bu. of gravel.

\$0.08 $\times$ $142\frac{2}{3}$ = \$$11.37\frac{7}{9}$, cost of gravel.

\$$23.70\frac{10}{27}$ + \$$11.37\frac{7}{9}$ = \$$35.08\frac{4}{27}$, Ans.

85. $100 \times 6 = 600$ sq. ft.

$12 \times 2 = 24$ bricks per sq. ft. (Art. 529.)

$24 \times 600 = 14400$ bricks $= 14.4$ thousand.

$\$8 \times 14.4 = \$115.20$, cost of bricks.

$14400 \div 1000 = 14.4$ casks of lime. (Art. 530.)

$\$1.10 \times 14.4 = \$15.84$, cost of lime.

$10 \times 14.4 = 144$ bu. of sand.

$\$0.10 \times 144 = \$14.40$, cost of sand.

$14400 \div 2000 = 7.2$ days' work.

$\$3 \times 7.2 = \$21.60$, mason's wages.

$\$1.75 \times 7.2 = \$12.60$, helper's wages.

$$\begin{array}{r} \$115.20 \\ 15.84 \\ 14.40 \\ 21.60 \\ 12.60 \\ \hline \$179.64, \text{ Ans.} \end{array}$$

86. $(34 + 27)$ or 61 ft. $\times 2 = 122$ ft.

$122 \times 9 = 1098$ sq. ft. $= 122$ sq. yd.; $1\frac{1}{2}$ ft. $= \frac{1}{2}$ yd.

122 sq. yd. $\times \frac{1}{2} = 61$ cu. yd.

$\frac{1}{2} \times \frac{1}{2} \times 3 \times 4 = 3$ cu. yd. in corners.

61 cu. yd. $+ 3$ cu. yd. $= 64$ cu. yd. in walls.

$1\frac{1}{8} \times 64 = 76\frac{4}{8}$ cu. yd. undressed stone.

1 perch, or $24\frac{3}{4}$ cu. ft., $\div 27 = \frac{11}{12}$ cu. yd.

$76\frac{4}{8}$ cu. yd. $\div \frac{11}{12} = 83\frac{4}{88}$ perches required.

$\$2.50 \times 83\frac{4}{88} = \$209.45\frac{4}{11}$, cost of stone.

$\frac{1}{5}$ cu. yd. $\times$ 64 = $12\frac{4}{5}$ cu. yd., mortar required.

15 cu. ft. $\div$ 27 = $\frac{5}{9}$ cu. yd., mortar for 1 cask of lime.

$12\frac{4}{5}$ cu. yd. $\div$ $\frac{5}{9}$ = $23\frac{1}{25}$ casks of lime.

\$ 1.00 $\times$ $23\frac{1}{25}$ = \$ 23.04, cost of lime.
10 $\times$ $23\frac{1}{25}$ = $230\frac{2}{5}$ bu. of sand.
\$ 0.10 $\times$ $230\frac{2}{5}$ = \$ 23.04, cost of sand.
1 day's work = 3 cu. yd. (Art. 528.)

64 $\div$ 3 = $21\frac{1}{3}$ day's work.
\$ 3.00 $\times$ $21\frac{1}{3}$ = \$ 64.00, mason's wages.
\$ 2.00 $\times$ $21\frac{1}{3}$ = \$ $42.66\frac{2}{3}$, helper's wages.

\$ $209.45\frac{5}{11}$,	cost of	stone.
23.04,	"	lime.
23.04,	"	sand.
64.00,	"	mason.
$42.66\frac{2}{3}$,	"	helper.
\$ $362.20\frac{4}{33}$,	Ans.	

Article 538.

57. 34 $\times$ 25 $\times$ 2 = 1700 sq. ft.
1000 shingles will cover 107 sq. ft. (Art. 533.)
1700 $\div$ 107 = $15.887\frac{81}{107}$ thousand shingles.
A carpenter will lay 2 M. in 1 day. (Art. 535.)
$15\frac{85}{107}$ $\div$ 2 = $7\frac{101}{107}$ days' work.
6 lb. nails are allowed for 1 M. shingles.

6 lb. $\times$ 15.888 = 95.328 lb. nails,
\$ 2.50 $\times$ $7\frac{101}{107}$ = \$ $19.85\frac{185}{107}$, cost of labor, } Ans.

88. 30 ft. × 63 ft. = 1890 sq. ft.
100 clapboards cover 130 sq. ft. (Art. 534.)

$$1890 \div 130 = 14.53\tfrac{1}{13} \text{ hundred, Ans.}$$

89. $64 \times 4 \times 2 = 512$ sq. ft. on both sides.
512 sq. ft. $\div 9 = 56\frac{8}{9}$ sq. yd.
$56\frac{8}{9} \div 4 = 14\frac{2}{9}$ lb., paint for 1st coat.
$56\frac{8}{9} \div 4\frac{1}{2} = 12\frac{62}{81}$ lb., " 2d "
The first coat requires $16\frac{1}{2}$ lb. lead to $7\frac{1}{2}$ lb. oil.

$$16\tfrac{1}{2} + 7\tfrac{1}{2} = 24 \text{ lb.}$$

$\frac{16\frac{1}{2}}{24}$ or $\frac{11}{16}$ of $14\frac{2}{9}$ lb. $= 9\frac{7}{9}$ lb., lead for 1st coat.

$\frac{7\frac{1}{2}}{24}$ or $\frac{5}{16}$ of $14\frac{2}{9}$ lb. $= 4\frac{4}{9}$ lb., oil " "

The 2d coat requires 20 lb. lead to $7\frac{1}{2}$ lb. oil.

$$20 + 7\tfrac{1}{2} = 27\tfrac{1}{2} \text{ lb.}$$

$\frac{20}{27\frac{1}{2}}$ or $\frac{8}{11}$ of $12\frac{62}{81} = 9\frac{173}{891}$ lb., lead for 2d coat.

$\frac{7\frac{1}{2}}{27\frac{1}{2}}$ or $\frac{3}{11}$ of $12\frac{62}{81} = 3\frac{133}{297}$ lb., oil " "

$9\frac{7}{9} + 9\frac{173}{891} = 18\frac{866}{891}$ lb., lead required.
$\$0.09 \times 18\frac{866}{891} = \$1.70\frac{74}{99}$, cost of lead.

$4\frac{4}{9} + 3\frac{133}{297} = 7\frac{264}{297}$ lb., oil required.
1 gallon oil weighs $7\frac{1}{2}$ lb.
$7\frac{264}{297} \div 7\frac{1}{2} = 1\frac{233}{495}$ gal., oil required.
$\$0.72 \times 1\frac{233}{495} = \$0.75\frac{378}{495}$, cost of oil.
$\$1.70\frac{74}{99} + \$0.75\frac{378}{495} = \$2.46\frac{244}{495}$, cost of paint, Ans.

$56\frac{8}{9} \div 80 = \frac{32}{45}$ day's work.

$\$2.50 \times \frac{32}{45} = \$1.77\frac{7}{9}$, painter's wages, Ans.

90. (20 + 18) or 38 ft. × 2 = 76 ft. around the room.
76 × 10 = 760 sq. ft. in walls.
18 × 20 = 360 sq. ft. in ceiling.
760 sq. ft. + 360 sq. ft. = 1120 sq. ft.
1120 − 108 = 1012 sq. ft. = $112\frac{4}{9}$ sq. yd.
100 laths will cover $5\frac{1}{9}$ sq. yd. (Art. 535.)
$112\frac{4}{9} \div 5\frac{1}{9} = 20\frac{4}{9}$ hundred laths, Ans.
$20\frac{4}{9}$ hundred = $2.0\frac{4}{9}$ thousand.
7 lb. nails are required for 1 M. laths. (Art. 536.)
7 lb. × $2.0\frac{4}{9} = 14\frac{14}{18}$ lb. nails.
$\$0.04\frac{1}{2} \times 14\frac{14}{18} = \$0.644$, cost of nails, Ans.

91. (64 + 40) or 104 ft. × 2 = 208 ft.
208 × 20 = 4160 sq. ft. in sides.
4160 − 360 = 3800 sq. ft. = 3800 bd. ft.
3800 bd. ft. = 3.8 thousand ft.
$\$20 \times 3.8 = \$76$, cost of boards, Ans.
A day's work = 1000 ft. (Art. 535.)
3.8 thousand ft. = 3.8 days' work.
3.8 ÷ 2 = 1.9 days' work for each man.
$\$2.25 \times 1.9 = \$4.275$, each man's wages, Ans.

Article 543.

94. (3 × 99) + 5 = 302, Ans.

95. $(\$0.00\frac{1}{3} \times 33) + 12 = \$0.23$, Ans.

96. $17 - \left(\frac{8}{9} \times 9\right) = 9$ mi., Ans.

97. $(\$0.04 \times 15) + 5 = \$0.65$, Ans.

Article 544.

99. $\frac{(2 + 478)}{2} \times 86 = 20640$, Ans.

100. $\frac{(\$7 + \$51)}{2} \times 12 = \$348$, Ans.

Article 546.

103. $20^4 = 160000$; $10 \times 160000 = 1600000$, Ans.

104.

$1.06^3 = 1.191016$; $\$120 \times 1.191016 = \$142.92192$, Ans.

105. Amount of \$1 for 1 y. at 6% = \$1.06, ratio.

$\$1.06^4 = \$1.26247696$.

$\$50 \times 1.26247696 = \$63.123848$, Ans.

Article 547.

107. $768 \times 2 = 1536$; $\frac{1536 - 6}{1} = 1530$, Ans.

108. $\left(\frac{3}{4}\right)^4$, or $\frac{81}{256}$, $\times 10 = \frac{405}{128}$, last term.

$\frac{405}{128} \times \frac{3}{4} = \frac{1215}{512}$.

$$\frac{10 - \frac{1215}{512}}{1 - \frac{3}{4}} = \frac{\frac{3905}{512}}{\frac{1}{4}} = \frac{3905}{128} = 30\tfrac{65}{128}, \text{ Ans.}$$

109. 1.06^3, or 1.191016, $\times 100 = \$119.1016$, last term.

$$\frac{\$119.1016 \times 1.06 - 100}{0.06} = \$437.4616, \text{ Ans.}$$

110. $4^9 = 262144 \times \$0.01 = \$2621.44$, last term.

$$\frac{\$2621.44 \times 4 - \$0.01}{4 - 1} = \$3495.25, \text{ Ans.}$$

Article 554.

2. 8 yr. 4 mo. = 100 mo.
$8 \times \$1 = \$8$, dues on 8 shares for 1 mo.
$100 \times \$8 = \$800$, cost of 8 shares, Ans.

3. 5 yr. = 60 mo.
$90 \times 7 \times \$1 = \$420$, cost of 1st series.
4 yr. 6 mo. = 54 mo.
$54 \times 3 \times \$1 = \$162$, cost of 2d series.
$\$420 + \$162 = \$582$, cost of stock, Ans.

Article 555.

5. $\frac{(2¢ + 16¢) \times 8}{2} = \$0.72$, fines on 1 share.
$8 \times \$1 = \$8$, dues on 1 share for 8 mo.
$\$8 + \$0.72 = \$8.72$, arrears and fines on 1 share.
$10 \times \$8.72 = \$87.20$, arrears and fines on 10 shares, Ans.

6. $\frac{(2¢ + 10¢) \times 5}{2} = \$0.30$, fines on 1 share.
$12 \times \$0.30 = \$3.60$, fines on 12 shares.
9 yr. 6 mo. = 114 mo.
$114 \times 12 \times \$1 = \$1368$, dues on 12 shares for 9 yr. 6 mo.
$\$1368 + \$3.60 = \$1371.60$, cost of 12 shares.
$12 \times \$200 = \$2400$, value at maturity.
$\$2400 - \$1368 + \$3.60 = \$1028.40$, net profit, Ans.

7. $\frac{(2¢ + 12¢) \times 6}{2} = \$0.42$, fines on 1 share.
$10 \times \$0.42 = \$4.20$, fines on 10 shares.
$100 \times 10 \times \$1 = \$1000$, dues on 10 shares.
$1000 + \$4.20 = \$1004.20$, cost of 10 shares.
$10 \times \$200 = \$2000$, value at maturity.
$\$2000 - \$1004.20 = \$995.80$, net profit, Ans.

Article 556.

9. Time 6 yr. 6 mo. = 78 mo.

$\frac{79 \times 78}{2} \times \frac{1}{2}\not{} = \frac{79 \times 78\not{}}{4} = \$15.405$, interest due.

$\$1$ each month for 78 mo. = $\$78$, amount paid in.

$\$78 + \$15.405 = \$93.405$, present value of 1 share.

$8 \times \$93.405 = \$747.24$, present value of 8 shares, Ans.

10. 8 yr. 4 mo. = 100 mo.

$\frac{100 \times 100}{2} \times \frac{5}{6}\not{} = \$42.08\frac{1}{3}$, interest due.

$\$1$ a month for 100 mo. = $\$100$, paid on each share.

$\$100 + 42.08\frac{1}{3} = \$142.08\frac{1}{3}$, present value of 1 share.

$16 \times \$142.08\frac{1}{3} = \$2273.33\frac{1}{3}$, present value of 16 shares, Ans.

11. 8 years = 96 mo.

$\left(\frac{97 \times 96}{2}\right) \times \frac{1}{2}\not{} = \$23.28$, interest due.

$\$1$ each month for 96 mo. = $\$96$, paid in.

$\$96 + \$23.28 = \$119.28$.

$6 \times \$119.28 = \$715.68$, present value, Ans.

12. 10 yr. = 120 mo.

$\left(\frac{121 \times 120}{2}\right) \times \frac{1}{2}\not{} = \$36.30$.

$\$1$ per month for 120 mo. = $\$120$.

$\$120 + \$36.30 = \$156.30$, Ans.

Article 557.

14. 8 yr. 6 mo. = 102 mo.

Installments of $\$1$ a month for 102 mo. = $\$102$.

$\$200 - \$102 = \$98$, profit.

$\frac{103 \times 102}{2} \times \frac{1}{2}\not{} = \frac{103 \times \$1.02}{4}$.

$\frac{1}{6}$ of $\frac{103 \times \$1.02}{4} = \frac{103 \times \$1.02}{24} = \$4.37\frac{3}{4}$.

$\$98 \div \$4.37\frac{3}{4} = 22.38+\%$, the rate of gain, Ans.

15. 10 yr. = 120 mo.

$102 paid in installments of $1 for 102 mo.

$200 − $120 = $80, profit.

$\frac{121 \times 120}{2} \times \frac{1}{2}¢ = 121 \times \$0.30$ at 6% a month.

$\frac{1}{6}$ of $121 \times \$0.30 = \$6.05$, at 1% a month.

$80 ÷ $6.05 = 13.2+%, gain, Ans.

Article 558.

17. $1.00 + $1.00 + $0.25 = $2.25, monthly payment on 1 share.

$16 \times \$2.25 = \$36$, monthly payment on 16 shares.

8 yr. 2 mo. = 98 mo.

$36 \times \frac{99 \times 98}{2} \times \frac{1}{2}¢ = \$873.18$, interest at 6%.

$98 \times \$36 = \$3528$, sum of payments.

$3528 + $873.18 = $4401.18, cost of loan, Ans.

18. $200 − $50 = $150.

Int. at 6% of $150 for 1 mo. = $0.75, interest paid.

$1.00 + $0.75 = $1.75, monthly payment on 1 share.

$20 \times \$1.75 = \$35$, monthly payment on 20 shares.

9 yr. = 108 mo.

$35 \times \frac{109 \times 108}{2} \times \frac{1}{2}¢ = \$1030.05$, interest at 6%.

$108 \times \$35 = \$3780$, sum of payments.

$3780 + $1030.05 = $4810.05, cost of loan, Ans.

Article 559.

20. $1.00 + $1.00 = $2, payment on 1 share each month.

$2 \times \left(\frac{113 \times 112}{4}\right)¢ = \$63.28$, interest on 1 share at 6%.

$2 \times 112 = \$224$, payments on 1 share.

$224 + $63.28 = $287.28, cost of 1 share.

$287.28 − $155 = $132.28, interest on 1 share $9\frac{1}{3}$ yr.

$132.28 ÷ $9\frac{1}{3}$ = $14.17+, average yearly interest.

$14.17 ÷ $155 = 0.0914 + 9.14+%, Ans.

21. $\$1.50 + \$1.00 = \$2.50$, payment on 1 share each month.

$2\frac{1}{2} \times \left(\frac{101 \times 100}{4}\right)¢ = \$63.12\frac{1}{2}$, interest on 1 share at 6%.

$100 \times \$2.50 = \$250$, payments on 1 share.

$\$250 + \$63.12\frac{1}{2} = \$313.12\frac{1}{2}$, cost of 1 share.

$\$313.12\frac{1}{2} - \$200 = \$113.12\frac{1}{2}$, interest on 1 share $8\frac{1}{8}$ yr.

$\$113.12\frac{1}{2} \div 8\frac{1}{8} = \$13.575$, average yearly interest.

$13.575 \div 200 = 6.7875\%$, rate of interest.

$6 \times \$313.12\frac{1}{2} = \$1878.75$, sum of payments, Ans.

Article 490.

PAGE 188. Ex. 58.

1 y. 1 mo. 22 d. = 412 d.

Time	= 412 d.	$900.65 = Principal.	
Interest for	60 d. =	9.0065 = .01 of principal.	
" "	300 " =	45.0325 = 5 × 60 days' interest.	
" "	30 " =	4.5032 = $\frac{1}{2}$ of 60 " "	
" "	20 " =	3.0021 = $\frac{2}{3}$ " 30 " "	
" "	2 " =	.3002 = $\frac{1}{10}$ " 20 " "	
" "	412 " =	$61.8445 at 6%.	
		900.65	

Ans. $962.4945 = Amount.

PAGE 188. EX. 60.

2 y. 8 mo. 28 d. = 988 d.

Time = 988 d. $653.63 = Principal.

Interest for 60 d. = 6.5363 = .01 of principal.
" " 900 " = 98.0445 = 15 × 60 days' interest.
" " 20 " = 2.1787 = $\frac{1}{3}$ of 60 " "
" " 5 " = .5446 = $\frac{1}{4}$ " 20 " "
" " 3 " = .3268 = $\frac{1}{20}$ " 60 " "
" " 988 d. = $107.6309 at 6%.
" " 988 " = 17.9384 " 1%.
" " 988 " = $125.5693 " 7%.
653.63

Ans. $779.1993 = Amount.

PAGE 189. EX. 79.

Time = 7 mo. 17 d.

2) $856.84 = Principal.
4.2842 = 1 month's interest.
$7\frac{17}{30}$ Time in months.
29.9894
2.4277
$32.4171 = Int. at 6%.
10.8057 = " " 2%.
$43.2228 = " " 8%.
856.84

Ans. $900.0628 = Amount.

PAGE 189. EX. 88.

Time = 2 mo. 26 d.

2)	$200.	= Principal.
	1.00	= 1 month's interest.
	$2\frac{13}{15}$	= Time in months.
	2.00	
	.866	
	$2.866	= Int. at 6%.
	.477	= " " 1%.
	4.777	= " " 10%.
	$200.	
Ans.	$204.777	= Amount.

PAGE 197. EX. 135.

Principal	$750.00
Int. from Oct. 12, 1896, to Dec. 27, 1896, 2 mo. 15 d.	9.38
Amount	$759.38
1st payment	325.00
New principal	$434.38
Int. from Dec. 27, 1896, to Aug. 7, 1897, 7 mo. 10 d.	15.93
Amount	$450.31
2d payment	25.00
New principal	$425.31
Int. from Aug. 7, 1897, to July 1, 1898, 10 mo. 24 d.	22.96
Amount due July 1, 1898 . . . . . Ans.	$448.27

PAGE 197. EX. 138.

$3000. *Boston, Feb. 9, 1896.*

For value received I promise to pay Charles E. Lowe, or order, three thousand dollars, on demand, with interest at 5 per cent.

Indorsements: Mar. 9, 1897, $1000.
Nov. 24, 1897, $800.

Principal	$3000.00
Int. from Feb. 9, 1896, to Mar. 9, 1897, 1 y. 1 mo.	162.50
Amount	$3162.50
1st payment	1000.00
New principal	$2162.50
Int. from Mar. 9, 1897, to Nov. 24, 1897, 8 mo. 15 d.	76.59
Amount	$2239.09
2d payment	800.00
New principal	$1439.09
Int. from Nov. 24, 1897, to Jan. 3, 1898, 1 mo. 9 d.	7.80
Amount due Jan. 3, 1898 . . . . . Ans.	$1446.89

PAGE 197. EX. 139.

Principal	$1200.00
Int. from Aug. 7, 1896, to May 13, 1897, 9 mo. 6 d.	36.80
Amount	$1236.80
1st payment	300.00
New principal	$936.80
Int. fr. May 13, 1897, to Nov. 23, 1898, 1 y. 6 m. 10 d.	57.25
Amount	$994.05
2d payment	275.00
New principal	$719.05
Int. from Nov. 23, 1898, to Jan. 1, 1899, 1 mo. 8 d.	3.04
Amount due Jan. 1, 1899 . . . . . Ans.	$722.09

PAGE 197. EX. 143.

Principal	$1728.00
Int. from Nov. 23, 1894, to May 15, 1895, 5 mo. 22 d.	74.30
Amount	$1802.30
1st payment	248.00
New principal	$1554.30
Int. fr. May 15, 1895, to Aug. 28, 1896, 1 y. 3 mo. 13 d.	179.91
Amount	$1734.21
2d payment	301.00
New principal	$1433.21
Int. from Aug. 28, 1896, to May 30, 1897, 9 mo. 2 d.	97.46
Amount	$1530.67
3d payment	300.00
New principal	$1230.67
Int. from May 30, 1897, to Nov. 10, 1897, 5 mo. 10 d.	49.23
Amount due Nov. 10, 1897 . . . . . Ans.	$1279.90

PAGE 227. EX. 39.

Principal		$500.00
Int. fr. Oct. 8, 1896, to Nov. 4, 1897, 1 y. 0 mo. 26 d.		32.17
Int. from Nov. 4, 1897, to Jan. 30, 1898, 2 mo. 26 d.		7.17
Amount		$539.34
1st payment, less than interest due . . .	$30.	
2d payment	250.	280.00
New principal		$259.34
Int. from Jan. 30, 1898, to July 1, 1898, 5 mo. 1 d.		6.53
Amount due July 1, 1898 . . . . . Ans.		$265.87

PAGE 269. EX. 66.

Principal	$1600.00
Int. from Jan. 1, 1889, to July 10, 1889, 6 mo. 9 d.	50.40
Amount	$1650.40
1st payment	200.00
New principal	$1450.40
Int. fr. July 10, 1889, to Aug. 15, 1890, 1 y. 1 mo. 5 d.	95.48
Amount	$1545.88
2d payment	200.00
New principal	$1345.88
Int. fr. Aug. 15, 1890, to May 12, 1891, 8 mo. 27 d.	59.89
Amount	$1405.77
3d payment	200.00
New principal	$1205.77
Int. from May 12, 1891, to Jan. 1, 1892, 7 mo. 19 d.	46.02
Amount due Jan. 1, 1892 . . . . . Ans.	$1251.79

PAGE 292. EX. 7.

Principal	$875.00
Int. fr. Jan. 1, 1889, to Mar. 10, 1890, 1 y. 2 mo. 9 d.	62.56
Amount	$937.56
1st payment	225.00
New principal	$712.56
Int. from Mar. 10, 1890, to Apr. 1, 1891, 1 y. 21 d.	45.25
Amount	$757.81
2d payment	145.00
New principal	$612.81
Int. from Apr. 1, 1891, to Dec. 31, 1891, 9 mo.	27.58
Amount due Dec. 31, 1891 . . . . . Ans.	$640.39

PAGE 293. EX. 9.

Principal	$750.00
Int. fr. Jan. 15, 1888, to Sept. 20, 1889, 1 y. 8 mo. 5 d.	75.63
Amount	$825.63
1st payment	250.00
New principal	$575.63
Int. fr. Sept. 20, 1889, to June 12, 1890, 8 mo. 22 d.	25.14
Amount	$600.77
2d payment	120.00
New principal	$480.77
Int. fr. June 12, 1890, to May 25, 1891, 11 mo. 13 d.	27.48
Amount due May 25, 1891 . . . . . Ans.	$508.25

PAGE 295. EX. 3.

From July 5, 1888, to June 1, 1890 = 1 y. 10 mo. 26 d.

2) $1250. = Principal.
6.25 = 1 month's interest.
$22\frac{13}{15}$ = Time in months.
12.50
125.0
5.41
3) $142.91662/3 = Interest at 6%.
47.6388 = " " 2%.
$190.5554 = " " 8%.
1250.
Ans. $1440.5554 = Amount.

PAGE 295. EX. 5.

Principal	$425.00
Int. fr. Mar. 25, 1890, to June 1, 1891, 1 y. 2 m. 6 d.	40.23
Amount	$465.23
1st payment	75.00
New principal	$390.23
Int. fr. June 1, 1891, to Dec. 30, 1891, 6 mo. 29 d.	18.12
Amount	$408.35
2d payment	120.00
New principal	$288.35
Int. fr. Dec. 30, 1891, to Sept. 1, 1892, 8 mo. 1 d.	15.44
Amount due Sept. 1, 1892 . . . . . Ans.	$303.79

Article 561.

1.

$2500. *Hardwick, Vt., June* 1, 1878.

For value received, I promise to pay J. H. McLoud, or bearer, two thousand five hundred dollars on demand, with interest annually.

JOEL FOSTER.

Indorsements:

Sept. 1, 1881. Received $500.00 on the within note.
March 1, 1885. " 1200.00 " " " "
May 1, 1886. " 100.00 " " " "
July 1, 1888. " 250.00 " " " "
Feb. 1, 1890. Settled.

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *June* 1, '82, $522.50	On $\frac{1}{2}$ *a.*, 6 y. $54.00	*a.* $600.00 (4 y.)	$2500.00
From Total Int. due, 654.00			
Leaves yearly Int. still due		131.50	
Due June 1, 1882.		*b.* $131.50	$2500.00
A of P_2 *June* 1, '85, $1218.00	On *b.*, 3 y. $23.67	*c.* 450.00 (3 y.)	
Less Total Int. due, 632.17	" *c.*, 3 y. 27.00		
Leaves surplus to reduce Prin.			585.83
Due June 1, 1885.	None.	None.	$1914.71
A *of* P_3 *June* 1, '86, $100.50		*d.* $114.85 (1 y.)	
From yearly Int. due, 114.85			
Leaves yearly Int. still due		14.35	
Due June 1, 1886.	None.	*e.* $14.35	$1914.17
A of P_4 *June* 1, '89, $263.75	On *e.*, 3 y, $2.58	*f.* 344.55 (3 y.)	
From Total Int. due, 382.15	" $\frac{1}{2}$*f.*, 3 y. 20.67		
Leaves yearly Int. still due		118.40	
Due June 1, 1889.	None.	*g.* $118.40	$1914.17
Int. to Feb. 1, '90,	On *g.*, 8 mos. $4.74	76.57 (8 m.)	
Total Int. due,			199.71
Amount due at Settlement,			$2113.88

2.

$600. *Hyde Park, Vt., March* 18, 1882.

One year from date, for value received, I promise to pay John Sanborn, or bearer, six hundred dollars, with interest annually.

RICHARD ROWE.

Indorsements:

Nov. 25, 1883.	Received	$125.00
Oct. 16, 1885.	"	20.00
Feb. 10, 1889.	"	200.00
April 15, 1890.	"	$12\frac{50}{100}$
May 1, 1890.	Settled.	

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *Mar.* 18, '84, $127.33	On $\frac{1}{2}$ *a.*, 1 y. $2.16	*a.* $72.00 (2 y.)	$600.00
Less Total Int. due, 74.16			
Leaves surplus to reduce Prin.,			53.17
Due March 18, 1884.	**None.**	**None.**	**$546.83**
A of P_2 *Mar.* 18, '86, $20.51	On $\frac{1}{2}$ *b.*, 1 y. $1.97	*b.* $65.62 (2 y.)	
From Total Int. due, 67.59			
Leaves yearly Int. still due,		47.08	
Due March 18, 1886.	**None.**	*c.* $47.08	**$546.83**
A of P_3 *Mar.* 18, '89, $201.27	On *c.*, 3 y. $8.47	*d.* 98.43 (3 y.)	
	On $\frac{1}{2}$ *d.*, 3 y. 5.91		
Less Total Int. due, 159.89			
Leaves surplus to reduce Prin.,			41.38
Due March 18, 1889.	**None.**	**None.**	**$505.45**
A of P_4 *May* 1, '90, $12.53	On 1 y. Int. $0.22	$33.95 (13 m. 13 d.)	
From Total Int. due, 34.17			
Leaves yearly Int. still due		21.64	
Total Int. due,			21.64
Am't due at Settlement,			**$527.09**

3.

$750. *St. Johnsbury, Vt., Dec.* 20, 1880.

Two years after date, for value received, we promise to pay Oliver Jackson, or bearer, seven hundred fifty dollars, with interest annually.

GEORGE SMALLEY.
FRANK SMALLEY.

Indorsements:

Dec. 20, 1883. Received 87\frac{50}{100}$
Feb. 19, 1887. " 12\frac{82}{100}$
Aug. 22, 1889. " 20.00
Mar. 5, 1890. Settled.

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *Dec.* 20, '83, $87.50	On $\frac{1}{2}$ *a.*, 3 y. $8.10	*a.* $135.00 (3 y.)	$750.00
From Total Int. due, 143.10			
Leaves yearly Int. still due,		55.60	
Due Dec. 20, 1883.	None.	*b.* $55.60	$750.00
A of P_2 *Dec* 20, '87, $13.25	On *b.*, 4 y. $13.34	*c.* 180.00 (4 y.)	
From Tot. Int. on y'rly Int. due, 29.54	" $\frac{1}{2}$ *c.*, 6 y. 16.20		
Leaves Int. on yearly Int. still due,	16.29		
Due Dec. 20, 1887.	$16.29	*d.* $235.60	$750.00
A of P_3 *Dec.* 20, '89, $20.39	On *d.*, 2 y. $28.27	*e.* 90.00 (2 y.)	
From Tot. Int. on y'rly Int. due, 47.26	" $\frac{1}{2}$ *e.*, 1 y. 2.70		
Leaves Int. on yearly Int. still due,	26.87		
Due Dec. 20, 1889.	$26.87	*f.* $325.60	$750.00
Int. to Mar. 5, 1890,	On *f.*, 2 m. 13 d. 3.96	9.13 (2m. 13 d.)	
Total Int. due,			365.56
Am't due at Settlement,			$1115.56

4.

$300. *Barton, Vt., March* 30, 1878.

For value received, I promise to pay Gray and Simpson, or bearer, three hundred dollars on demand, with interest annually.

S. B. KINGSLEY.

Indorsements:

Mar. 30, 1879.	Received 1 yr.'s int. on within note,		$18.00
" " 1880.	" " " " " " "		18.00
" " 1881.	" " " " " " "		18.00
" " 1882.	" " " " " " "		18.00
" " 1883.	" " " " " " "		18.00
" " 1884.	" " " " " " "		18.00
" " 1885.	" " " " " " "		18.00
Mar. 30, 1890.	Settled.		

The payment of the annual interest for 6 years, when due, leaves only the principal, $300.00, due Mar. 30, 1885.

Yearly interest of Prin. to Mar. 30, '90 (5 y.),	$90.00
Int. on yearly int. ($18.00) for 10 y.,	10.80
Principal due,	300.00
Am't due at Settlement,	$400.80

5.

$2125.75 *Underhill, Vt., June* 17, 1879.

Six months from date, for value received, I promise to pay John Smith, or order, two thousand one hundred twenty-five and $\frac{75}{100}$ dollars, with interest annually.

B. G. JACKSON.

Indorsements:

June 19, 1881. Received $15\frac{75}{100}$ on within.
Sept. 4, 1883. " 500.00 " "
April 6, 1886. " $19\frac{50}{100}$ " "
May 19, 1887. " 1000.00 " "
July 15, 1890. " 700.00 " "
June 3, 1881. Settled.

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *June* 17, '82, $16.69	On $\frac{1}{2}$ *a.*, 3 y. $22.96	*a.* $328.64 (3 y.)	$2125.75
From Int. on y'rly Int. due, 22.96			
Leaves Int. on y'ly Int. still due,	6.27		
Due June 17, 1882.	$6.27	*b.* $382.64	$2125.75
A of P_2 *June* 17, '84, $523.58	On *b.*, 2 y. 45.92	*c.* 255.09 (2 y.)	
From Tot. Int. due, 697.57	On $\frac{1}{2}$ *c.*, 1 y. 7.65		
Leaves y'rly Int. still due,		173.99	
Due June 17, 1884.	None.	*d.* $173.99	$2125.75
A of P_3 *June* 17, '86, $19.73	On *d.*, 2 y. $20.88	*e.* 255.09 (2 y.)	
From Int. on y'rly Int. due, 28.53	" $\frac{1}{2}$ *e.*, 1 y. 7.65		
Leaves Int. on y'rly Int. still due,	8.80		
Due June 17, 1886.	$8.80	*f.* $429.08	$2125.75
A of P_4 *June* 17, '87, $1004.83	On *f.*, 1 y. 25.74	*g.* 127.55 (1 y.)	
Less Total Int. due, 591.17			
Leaves to reduce Prin.,			413.66
Due June 17, 1887.	None.	None.	$1712.09
A of P_5 *June* 3, '91, $737.22	On *h.* (5y. 10m. 21d.) $36.32	*h.* 407.19 (3y. 11m. 17d.)	
Less Total Int. due, 443.51			
Leaves to reduce Prin.,			293.71
Am't due at Settlement,			$1418.38

6.

$400. *Swanton, Vt., May 28, 1885.*

For value received, I promise to pay Charles Dunn, or bearer, four hundred dollars on demand, with interest annually.

R. G. SMITH.

Indorsements:

June 5, 1886.	Received	$24.00
Nov. 24, 1886.	"	50.00
Feb. 15, 1887.	"	50.00
June 11, 1887.	"	$121\frac{75}{100}$
Nov. 25, 1887.	"	100.00
May 30, 1889.	"	$2\frac{1}{100}$
Dec. 26, 1890.	"	$12\frac{25}{100}$
Mar. 13, 1891.	Settled	

		Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *May* 28, '87.	$25.41	On $\frac{1}{2}$ *a.*, 1 y. $1.44	*a.*, $48.00 (2y.)	$400.00
" " P_2 " " "	51.53			
" " P_3 " " "	50.83			
Am't of Pay'ts,	127.77			
Less Total Int. due,	49.44			
Leaves to reduce Prin.,				78.33
Due May 28, 1887.		**None.**	**None.**	$321.67
A of P_4 *May* 28, '88.	$126.79		(*b.*) $19.30 (1 y.)	
" " P_5 " " "	103.05			
Am't of Pay'ts,	231.84			
Less Total Int. due,	19.30			
Leaves to reduce Prin.,				212.54
Due May 28, 1888.		**None.**	**None.**	$109.13
A of P_6 *May* 28, '90,	$2.22	On $\frac{1}{2}$ *c.*, (1 y.) $0.39	(*c.*) $13.10 (2 y.)	
From Total Int. due,	13.49			
Leaves y'rly Int. due,			11.27	
Due May 28, 1888.		**None.**	(*d.*) $11.27	$109.13
A of P_7 *Mar.* 13, '91,	$12.40	On *d.*, (9m. 13d.) $0.53	5.15 (9m. 13d.)	
From Total Int. due,	16.95			
Leaves Int. still due,				4.55
Am't due at Settlement,				$113.68

7.

$350. *Danville, Vt., Aug.* 17, 1878.

Sixty days from date, for value received, I promise to pay Park Davis, or bearer, three hundred fifty dollars, with interest annually.

JOEL HUNTINGTON.

Indorsements:

Aug. 17, 1880.	Received	$100.00
Aug. 2, 1881.	"	$3\frac{50}{100}$
Aug. 30, 1883.	"	7.00
Jan. 26, 1884.	"	30.00
April 19, 1884.	"	25.00
June 17, 1884.	"	30.00
Aug. 11, 1884.	"	50.00
Aug. 29, 1884.	"	10.00
Aug. 18, 1886.	"	60.00
Aug. 17, 1888.	"	13.00
Aug. 28, 1888.	"	$1\frac{25}{100}$
May 23, 1889.	"	$3\frac{50}{100}$
Aug. 3, 1889.	"	22.00
April 1, 1890.	Settled.	

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *Aug.* 17, '80, $100.00	On $\frac{1}{2}$ *a.*, 1 y. $1.26	*a.* $42.00 (2 y.)	$350.00
Less Total Int. due, 43.26			
Leaves to reduce Prin.,			56.74
Due Aug. 17, 1880.	**None.**	**None.**	$293.26
A of P_2 *Aug.* 17, '81, $3.51		$17.60 (1 y.)	
From y'rly Int. due, 17.60			
Leaves y'rly Int. still due,		14.09	
Due Aug. 17, 1881.	**None.**	*b.* $14.09	$293.26
A of P_3 *Aug.* 17, '84, $7.41	On *b.*, 3 y. $2.54	*c.* 52.79 (3 y.)	
" " P_4 " " " 31.01	" $\frac{1}{2}$ *c.*, 3 y. 3.17		
" " P_5 " " " 25.50			
" " P_6 " " " 30.30			
" " P_7 " " " 50.05			
Am't of Pay'ts, 144.27			
Less Total Int. due, 72.59			
Leaves to reduce Prin.,			71.68
Due Aug. 17, 1884.	**None.**	**None.**	$221.58
A of P_8 *Aug.* 17, '85, $10.58		$13.30 (1 y.)	
From y'rly Int. due, 13.30			
Leaves y'rly Int. still due,		2.72	
Due Aug. 17, 1885.	**None.**	*d.* $2.72	$221.58
A of P_9 *Aug.* 17, '87, $63.60	On *d.*, 2 y. $0.33	*e.* 26.59 (2 y.)	
Less Total Int. due, 30.44	" $\frac{1}{2}$ *e.*, 1 y. 0.80		
Leaves to reduce Prin.,			33.16
Due Aug. 17, 1887.	**None.**	**None.**	$188.42
A of P_{10} Aug. 17, '88, $13.00		$11.31 (1 y.)	
Less Total Int. due, 11.31			
Leaves to reduce Prin.,			1.69
Due Aug. 17, 1888.	**None.**	**None.**	$186.73
A of P_{11} *Aug.* 17, '89, $1.32		$11.20 (1 y.)	
" " P_{12} " " " 3.55			
" " P_{13} " " " 22.05			
Am't of Pay'ts, 26.92			
Less y'rly Int. due, 11.20			
Leaves to reduce Prin.,			15.72
Due Aug. 17, 1889.	**None.**	**None.**	$171.01
Int. to April 1, 1890,	(7 m. 15 d.)		6.41
Am't due at Settlement,			$177.42

8.

$84.96 *Barre, Vt., Jan.* 1, 1882.

For value received, we jointly and severally promise to pay T. J. Cree, or bearer, eighty-four and $\frac{96}{100}$ dollars on demand, with interest annually.

ELIJAH COOK.
HIRAM BARTLETT.

Indorsements:

May 21, 1884.	Received	$8\frac{42}{100}$
Sept. 8, 1884.	"	$11\frac{70}{100}$
July 15, 1885.	"	$4\frac{25}{100}$
March 1, 1887.	"	$16\frac{50}{100}$
Oct. 3, 1888.	"	$3\frac{15}{100}$
March 1, 1890.	Settled.	

		Int. on Yearly Interest.		Yearly Interest.	Principal.
A of P_1 *Jan.* 1, '85,	$8.73	On $\frac{1}{2}$ *a.*, 3 y.	$0.92	*a.* $15.29 (3 y.)	$84.96
" " P_2 " " "	11.92				
Am't of Pay'ts,	20.65				
Less Total Int. due,	16.21				
Leaves to reduce Prin.,					4.44
Due Jan. 1, 1885.		None.		None.	$80.52
A of P_3 *Jan.* 1, '86,	$4.37			$4.83 (1 y.)	
From y'rly Int. due,	4.83				
Leaves y'rly Int. still due,				0.46	
Due Jan. 1, 1886.		None.		*b.* $0.46	$80.52
A of P_4 *Jan.* 1, '88,	$17.33	On *b.*, 2 y.	$0.06	*c.* 9.66 (2 y.)	
Less Total Int. due,	10.47	" $\frac{1}{2}$ *c.*, 1 y.	0.29		
Leaves to reduce Prin.,					6.86
Due Jan. 1, 1888.		None.		None.	$73.66
A of P_5 *Jan.* 1, '89,	$3.20			$4.42 (1 y.)	
From y'rly Int. due,	4.42				
Leaves y'rly Int. still due,				1.22	
Due Jan. 1, 1889.		None.		*d.* $1.22	$73.66
Int. to Mar. 1, '90,		On *d.*, (1-2)	$0.09	*e.* 5.16 (1 y. 2 m.)	
		" *e.*, (2 m.)	0.04		
Tot. Int. due Mar. 1, 1890,					6.51
Am't due at Settlement,					$80.17

9.

$5000. *Springfield, Vt., March* 10, 1879.

For value received, I promise to pay J. A. A. Thomas, or bearer, five thousand dollars on demand, with interest annually, after two years. A. B. Thomas.

Indorsements:

Nov. 15, 1884.	Received	$200.00
June 20, 1886.	"	50.00
Oct. 10, 1886.	"	75.00
Dec. 24, 1886.	"	300.00
May 21, 1888.	"	30.00
Jan. 16, 1890.	"	2000.00
May 16, 1890.	Settled.	

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *Mar.* 10, '85, $203.77	On $\frac{1}{2}$ *a.*, 6 y. $108.00	*a.* $1200.00 (4 y.)	$5000.00
From Tot. Int. due, 1308.00			
Leaves y'rly Int. still due,		1104.23	
Due March 10, 1885.	**None.**	*b.* $1104.23	$5000.00
A of P_2 *Mar.* 10, '87, $52.15	On *b.*, 2 y. $132.51	*c.* 600.00 (2 y.)	
" " P_3 " " " 76.88	" $\frac{1}{2}$ *c.*, 1 y. 18.00		
" " P_4 " " " 303.70			
Am't of Pay'ts, 432.73			
From Tot. Int. due, 1854.74			
Leaves y'rly Int. still due,		1422.01	
Due March 10, 1887.	**None.**	*d.* $1422.01	$5000.00
A of P_5 *Mar.* 10, '89, $31.44	On *d.* 2 y. $170.64	*e.* 600.00 (2 y.)	
From Int. on y'rly Int. due, 188.64	" $\frac{1}{2}$ *e.*, 1 y. 18.00		
Leaves Int. on y'rly Int. still due,	157.20		
Due March 10, 1889.	**$157.20**	*f.* $2022.01	$5000.00
A of P_6 *Mar.* 10, '90, $2017.33	On *f.* 1 y. $121.32	300.00 (1 y.)	
From Tot. Int. due, 2600.53			
Leaves Int. on y'rly Int. still due,		583.20	
Due March 10, 1890.	**None.**	*g.* $583.20	$5000.00
Int. to May 16, '90,	On *g.* (2 m. 6 d.) $6.24	55.00 (2 m. 6 d.)	
Total Int. due,			644.62
Am't due at Settlement,			$5644.62

10.

$1000. *Burlington, Vt., May* 19, 1876.

For value received, I promise to pay W. H. Howe, or order, one thousand dollars on demand, with interest annually, at five per cent.

JOHN DOE.

Indorsements:

Mar. 25, 1880. Received $25.00 on within.
Nov. 20, 1884. " 375.00 " "
July 13, 1887. " 500.00 " "
Dec. 19, 1889. Settled.

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P_1 *May* 19, '80, $25.19	On $\frac{1}{4}$ *a.*, 6 y. $15.00	*a.* $200.00 (4 y.)	$1000.00
From Tot. Int. due, 215.00			
Leaves y'rly Int. still due,		189.81	
Due May 19, 1880.	None.	*b.* $189.81	$1000.00
A of P_2 *May* 19, '85, $384.32	On *b.*, 5 y. $47.45	*c.* 250.00 (5 y.)	
From Tot. Int. due, 512.26	" $\frac{1}{5}$ *c.*, 10 y. 25.00		
Leaves y'rly Int. still due,		127.94	
Due May 19, 1885.	None.	*d.* $127.94	$1000.00
A of P_3 *May* 19, '88, $521.25	On *d.*, 3 y. $19.19	*e.* 150.00 (3 y.)	
Less Tot. Int. due, 304.63	" $\frac{1}{3}$ *e.*, 3 y. 7.50		
Leaves to reduce Prin.,			216.62
Due May 19, 1888.	None.	None.	$783.38
Int. to Dec. 19, '89,	On *f.*, 7 m. $1.14	*f.* $47.00 (1 y.) 15.02 (7 m.)	
Total Int. due,			63.16
Am't due at Settlement,			$846.54

11.

$2000. *Bellows Falls, Vt., Oct.* 5, 1870.

One year after date, I promise to pay F. C. Atwell, or bearer, two thousand dollars, with interest annually.

FRANK T. TYLER.

Indorsements:

May 10, 1874.	Received	$200.00
Oct. 10, 1876.	"	20.00
Sept. 5, 1877.	"	30.00
May 17, 1880.	"	$27\frac{50}{100}$
July 12, 1881.	"	700.00
May 5, 1885.	"	30.00
Nov. 11, 1888.	Settled.	

	Int. on Yearly Interest.	Yearly Interest.	Principal.
A of P$_1$ *Oct.* 5. '74, $204.83	On ½ *a.*, 6 y. $43.20	*a.* $480.00 (4 y.)	$2000.00
From Tot. Int. due, 523.20			
Leaves y'rly Int. due,		318.37	
Due Oct. 5, 1874.	**None.**	*b.* $318.37	$2000.00
A of P$_2$ *Oct.* 5, '77, $21.18	On *b.*, 3 y. $57.31	*c.* 360.00 (3 y.)	
" " *P*$_2$ " " " 30.15	" ½ *c.*, 3 y. 21.60		
Am't of Pay'ts, 51.33			
From Int. on y'rly Int. due, 78.91			
Leaves Int. on y'rly Int. still due,	27.58		
Due Oct. 5. 1877.	**$27.58**	*d.* $678.37	$2000.00
A of P$_4$ *Oct.* 5, '80, $28.13	On *d.* 3 y. $122.11	*e.* 360.00 (3 y.)	
From Int. on y'rly Int. due, 171.29	" ½ *e.*, 3 y. 21.60		
Leaves Int. on y'rly Int. still due,	143.16		
Due Oct. 5, 1880.	**$143.16**	*f.* $1038.37	$2000.00
A of P$_5$ *Oct.* 5, '81, $709.68	On *f.*, 1 y. 62.30	120 (1 y.)	
From Tot. Int. due, 1363.83			
Leaves y'rly Int. still due,		654.15	
Due Oct. 5, 1881.	**None.**	*g.* $654.15	$2000.00
A of P$_6$ *Oct.* 5, '85, $30.75	On *g.*, 4 y. 157.00	*h.* 480.00 (4 y.)	
From Int. on y'rly Int. due, 200.20	" ½ *h.*, 6 y. 43.20		
Leaves Int. on y'rly Int. still due,	169.45		
Due Oct. 5, 1885.	**$169.45**	*i.* $1134.15	$2000.00
Int. to Nov. 11, '88,	On *i.*, 210.95	*j.* 372.00 (3-1-6)	
	On y'rly Int. 23.76		
Total Int. due,			1910.31
Am't due at Settlement,			$3910.31

12.

See No. 8. In writing the note, omit "annually."

	Int.	Prin.
Int. from date to P_1 (2 y. 4 m. 20 d.)	$12.18	$84.96
Less P_1	8.42	
Unpaid Interest	3.76	
Int. from P_1 to P_2 (3 m. 18 d.)	1.53	
Total Interest due	5.29	
From P_2	11.70	
Leaves to reduce Principal		6.41
Int. from P_2 to P_3 (10 m. 17 d.)	4.02	78.55
From P_3	4.25	
Leaves to reduce Principal		0.23
Int. from P_3 to P_4 (1 y. 7 m. 14 d.)	7.62	78.32
From P_4	16.50	
Leaves to reduce Principal		8.88
Int. from P_4 to P_5 (1 y. 7 m. 2 d.)	6.62	69.44
Less P_5	3.15	
Unpaid Interest	3.47	
Int. from P_5 to Settlement (1y. 4m. 26d.)	5.86	
Total Interest due		9.33
Am't due at Settlement		$78.77

13.

For note, see No. 9. Omit "annually" in writing note.

	Pay'ts.	Int.	Prin.
Int. from date to P_1 (3 y. 8 m. 5 d.)		$1104.17	$5000.00
P_1	$200.00		
Int. from P_1 to P_2 (1 y. 7 m. 5 d.)		479.17	
P_2	50.00		
Int. from P_2 to P_3 (3 m. 20 d.)		91.67	
P_3	75.00		
Int. from P_3 to P_4 (2 m. 14 d.)		61.67	
P_4	300.00		
Int. from P_4 to P_5 (1 y. 4 m. 27 d.)		422.50	
P_5	30.00		
Int. from P_5 to P_6 (1 y. 7 m. 26 d.)		496.67	
P_6	2000.00		
Int. from P_6 to Settlement (4 m.)		100.00	
Total Interest		2755.85	
Less Sum of Payments		2655.00	
Leaves unpaid Interest			100.85
Am't due at Settlement			$5100.85

NOTE. — It will be observed that no payment was large enough to cancel the interest due when the payment was made.

14.

For note, see No. 10, omitting "annually."

	Pay'ts.	Int.	Prin.
Int. from date to P_1 (3 y. 10 m. 6 d.)		$192.50	$1000.00
P_1	$25.00		
Int. from P_1 to P_2 (4 y. 7 m. 26 d.)		232.78	
P_2	375.00		
Int. from P_2 to P_3 (2 y. 7 m. 23 d.)		132.36	
P_3	500.00		
Sum of Payments	900.00		
Less Total Interest due		557.64	
Leaves to reduce Principal			342.36
			657.64
Int. from P_3 to Settlement (2 y. 5 m. 6d.)			80.01
Am't due			$737.65

Article 564.

2. 1% of $2675 — $26.75, grand list.
65% + 10% + 15% = 90%
90% of $26.75 = $24.075, B's total tax.

3. $1000 = $500 = $500, taxable personal property.
$2500 + $500 = $3000, value of taxable property.
1% of $3000 = $30, property list.
$30 + $2 = $32, grand list.
30% + 5% + 20% = 55%, rate of taxation.
55% of $32 = $17.60, A's total tax.

4. $3000 = B's taxable property.
1% of $3000 = $30, grand list.
30% of $30 = $9.00, town tax.
5% of $30 = $1.50, state school tax.
20% of $30 = $6.00, highway tax.
$16.50, B's total tax.

5. $532080 + $419914 = $951994, value of taxable property.
1% of $951994 = $9519.94, property list.
$2 × 350 = $700, poll list.
$9519.94 + $700 = $10219.94, grand list.
55% of $10219.94 = $5620.967, total tax.
1% of $5620.967 = $56.209, collector's commission.

6. $5620.967, total tax.
5% of $10219.94 = $511, state tax.
$56.21, collector's commission, + $511 = $567.21, amount deducted.
$5620.967 − $567.21 = $5053.76, balance for town expenses.

7. $395000 + $150000 = $545000, taxable property.
1% of $545000 = $5450, property list.
$2 × 400 = $800, poll list.
(*a*) $5450 + $800 = $6250, grand list.
(*b*) $5625 ÷ $6250 = 90%, rate of taxation.
(*c*) 1% of $3600 = $36, property list.
$36 + $2 = $38, grand list.
90% of $38 = $34.20, tax.
(*d*) $4000 + $2850 = $6850, taxable property.
1% of $6850 = $68.50, grand list.
90% of $68.50 = $61.65, Mrs. A's tax.

8. Grand list = tax raised ÷ rate of taxation.
$8555 ÷ .75 = $11406⅔, grand list.
$2 × 700 = $1400, poll list.
$11406⅔ − $1400 = $10006⅔, property list.
$10006⅔ × 100 = $1000666⅔, value of property.

9. $2000 − $1500 = $500, taxable Savings Bank deposit.
$2000 + $3500 + $500 = $6000, taxable property.
1% of $6000 = $60, property list.
$60 + $2 = $62, grand list.
50% of $62 = $31.00, town tax.
5% of $62 = $3.10, state school tax.
20% of $62 = $12.40, highway tax.
$46.50, total tax.

10. $1700 − $1500 = $200, taxable personal property.
1% of $200 = $2, property list.
$2 + $2 = $4, grand list.
50% + 5% + 20% + 8% = 83%, rate of taxation.
83% of $4 = $3.32, tax.

11. $1800 − $1500 = $300, taxable Savings Bank deposit.
$4500 + $1200 + $300 = $6000, value of taxable property.
1% of $6000 = $60, property list.
$60 + $2 = $62, grand list.
20% + 10% = 30%, rate of highway tax.
30% of $62 = $18.60, highway tax.
$18.60 ÷ $1.50 = 12⅖ days.

12. 1% of $100 = $1, property list.
$1 + $2 = $3, grand list.
30% of $3 = $0.90, highway tax.
$0.90 ÷ $1.50 = ⅗ day.

13. $6000 + $800 + $3000 + $500 + $2000 = $12300, value of property.
$12300 × 2 = $24600, double the value of property.
1% of $24600 = $246, property list.
$246 + $2 = $248, grand list.
55% + 5% + 20% = 80%, rate of taxation.
80% of $248 = $198.40, total tax.

14. $150 + $250 = $400, value of property.
$400 × 2 = $800, double value of property.
1% of $800 = $8, property list.
$8 + $2 = $10, grand list.
80% of $10 = $8, tax.

15. $2 × 70 = $140, poll list.
$800 − $140 = $660, property list.
As $660 is 1% of property valuation, the value of property is 100 times $660, or $66000.

16. $428921 + $396284 = $825205, property valuation.
1% of $825205 = $8252.05, property list.
$2 × 311 = $622, poll list.
$8252.05 + $622 = $8874.05, grand list.

17. Tax to be raised = liabilities ÷ (1 − rate of discount).
$38806.07 ÷ .96 = $40422.99, tax to be raised.
Rate = tax to be raised ÷ grand list.
$40422.99 ÷ 41933.77 = 96.397+%, rate of taxation.

Article 565.

1. *a.* $1 \div 4 = \frac{1}{4}$

b. $1 \div \frac{4}{5} = 5 \times \frac{1}{4} = \frac{5}{4}$

c. $\frac{3}{4}$ of $1 \div \frac{4}{5} = \frac{3}{4}$ of $\frac{5}{4}$ or $\frac{15}{16}$, Ans.

2.

			6'321.'550'00 (18.49 +
$10^2 \times 3 =$	300	1	
$10 \times 8 \times 3 =$	240	5321	
$8^2 =$	64		
	604	4832	
$180^2 \times 3 =$	97200	489550	
$180 \times 4 \times 3 =$	2160		
$4^2 =$	16		
	99376	397504	
$1840^2 \times 3 =$	10126800	92046000	
$1840 \times 9 \times 3 =$	50680		
$9^2 =$	81		
	10177561	91608049	
		437951	

3. $\left(\frac{\frac{1}{2}}{\frac{6}{8}} - \frac{2}{3}\right) \div \frac{1}{4}$ of $2\frac{1}{3} \times \frac{6}{1\frac{1}{2}}$

a. $\frac{1}{2} \div \frac{5}{8} = \frac{1}{\cancel{2}} \times \frac{\overset{4}{\cancel{8}}}{5} = \frac{4}{5}$; $\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

b. $\frac{1}{4}$ of $2\frac{1}{3} \times \frac{6}{1\frac{1}{2}} = \frac{1}{\cancel{4}} \times \frac{7}{\cancel{3}} \times \cancel{6} \times \frac{\cancel{2}}{3} = \frac{7}{3}$

c. $\frac{2}{15} \div \frac{7}{3} = \frac{2}{\overset{5}{\cancel{15}}} \times \frac{\cancel{3}}{7} = \frac{2}{35}$, Ans.

4. $2.25 \times 4.75 \times 3.2 = 34.2$ (cu.m.)
1 cu.m. = 1000 liters; 34.2×1000 l. = 34200 l.
1 liter of water weighs 1 kilogram or 1000 grams.
34200×1000 grams = 34200000 grams.

5. $\$500 \div 90\% = \$555\frac{5}{9}$ Par value.
$\$600 - \$555\frac{5}{9} = \$44\frac{4}{9}$ Gain.
$\$44\frac{4}{9} \div \$555\frac{5}{9} = 8\%$ Gained.

6. 10 men and 20 boys = 20 men.
What 10 men can do in 10 days, 1 man can do in 10×10 days, and 20 men in $\frac{1}{20}$ of 10×10 days, or 5 days. Ans.

7. $\$120 = \frac{3}{4}$ of cost of second horse or \$160.
The loss in this sale = \$160 − \$120 = \$40.
$\$160 = \frac{4}{5}$ of cost of first horse, or \$120.
The gain in first sale was \$160 − \$120 = \$40.
Gain, \$40; Loss, \$40; Net gain, nothing.

8. \$1.00 at compound interest amounts to \$1.191016 in 3 y.
$\$500 \div \$1.191016 = \$419.81$, the principal required to yield \$500.

9. 0.4536 kilograms or 453.6 grams = 7000 grains.
1 gram = $\frac{7000}{453.6}$ grains; $3\frac{1}{3}$ grams = $\frac{10}{3} \times \frac{7000}{453.6}$ gr. = 56.584 gr.

Article 566.

1. *a.* $\frac{2\frac{2}{3} \times 5\frac{1}{4}}{\frac{3}{4}} = \frac{8}{3} \times \overset{7}{\cancel{21}} \times \frac{\cancel{4}}{\cancel{3}} = \frac{56}{3}$

b. $\frac{5\frac{1}{3} - 2\frac{3}{5}}{\frac{1}{7} \text{ of } \frac{5}{6}} = \frac{5\frac{5}{15} - 2\frac{9}{15}}{\frac{1}{7} \text{ of } \frac{5}{6}} = \frac{3\frac{1}{2}}{\frac{5}{42}} = \frac{\overset{14}{\cancel{28}}}{\cancel{9}_{3}} \times \frac{\overset{7}{\cancel{21}}}{\cancel{10}_{5}} = \frac{98}{15}$

c. $\frac{56}{3} + \frac{98}{15} = \frac{\overset{4}{\cancel{56}}}{\cancel{3}} \times \frac{\overset{5}{\cancel{15}}}{\cancel{98}_{7}} = \frac{20}{7} = 2\frac{6}{7}$, Ans.

2. $0.0135 \times 1.005 = 0.0135675$

$0.0135675 \div 0.0042 = 3.23035+$

3.

```
    46'24 ( 68                0.03'68'64 (0.192
      36                          1
128 1024                    29  268
    1024                        261
                            382   764
                                  764
```

4. $\sqrt{120 \text{ sq. rds.}} = 10.9544 + \text{ rds.}$

$10.9544 + \text{ rds.} = 10.9544 \times 16\frac{1}{2} \text{ ft.} = 180.7476 \text{ ft.}$

$180.7476 \times \$1.50 = \$271.12$

5. In order to double itself in 12 years, a sum of money must gain 100% of itself; this requires that $\frac{1}{12}$ of 100%, or $8\frac{1}{3}\%$ must be gained each year.

6. 100 liters = 100 cu. decimeters, or 100000 cu. centimeters; $\sqrt[3]{100000} = 46.4 +$ cm.

1 liter of water weighs 1 kilogram.
100 liters " " weigh 100 kilograms.
1 kilogram = 1000 grams.
100 kilograms = 1000 grams $\times$ 100 = 100000 grams.

7. $(15235 - 12164) \div 12164 = 25.2 + \%$

$(17895 - 15235) \div 15235 = 17.4 + \%$

8. $1\frac{1}{4}\% + \frac{1}{2}\% + \frac{3}{20}\%$ of \$5000 = \$95
($350 − \$95) ÷ \$5000 = 5.1%

Article 567.

1. Add $\frac{1}{3}$ of $\frac{2}{7}$ of $28\frac{3\frac{6}{7}}{4\frac{3}{7}}$ to $3\frac{39\frac{1}{2}}{105}$

a. $28\frac{3\frac{6}{7}}{4\frac{3}{7}} = 28\frac{\frac{27}{7}}{\frac{30}{7}} = 28\frac{27}{30} = 28\frac{9}{10} = \frac{289}{10}$

b. $3\frac{39\frac{1}{2}}{105} = 3\frac{\frac{79}{2}}{105} = 3\frac{79}{210}$

c. $\frac{1}{3}$ of $\frac{2}{7}$ of $\frac{289}{10} = \frac{578}{210} = 2\frac{158}{210}$

d. $2\frac{158}{210} + 3\frac{79}{210} = 5\frac{237}{210} = 6\frac{27}{210} = 6\frac{9}{70}$, Ans.

2. *a.* $14\frac{7}{12} \times 5\frac{7}{12} \times 4\frac{1}{3} = \frac{175}{12} \times \frac{67}{12} \times \frac{13}{3} = \frac{152425}{432} =$
$352\frac{241}{432}$ (cu. in.).

b. $7\frac{3}{16} \times 4\frac{1}{2} \times 3\frac{1}{2} = \frac{115}{16} \times \frac{9}{2} \times \frac{7}{2} = \frac{7245}{64} =$
$113\frac{13}{64}$ (cu. in.).

c. $(352\frac{241}{432} - 113\frac{13}{64}) \div 2150\frac{2}{3} = 0.1172 +$ bu.

3. .000005) 223.0475
5)223 047500.
446 09500.

a. Am't for 3 y. 19 d. $= 1.183\frac{1}{3}$ of Prin. or $1.183\frac{1}{3}$ of \$1000 = \$1183.17.

b. Am't at Comp. Int. of \$1 for 3 y. = \$1.191016. [See table, p. 201.]
Am't of \$1.191016 for 19 d. $= 1.003\frac{1}{3} \times$ \$1.191016 = \$1.194788.
Am't of \$1000 for 3 y. 19 d. = 1000 × \$1.194788 = \$1194.79.

c.

Annual Int. of \$1000 for 3 y. 19 d. =	\$183.17
Int. on An. Int. of \$60 for 3 y. 57 d. =	11.37
Principal	1000.
Amount	\$1194.54

5. 1 h. 25 m. 4 sec. shows a difference of 21° 16′ in longitude (15° × 1 − 25 − 4).

If B is 90° West longitude, A is 90° + (21° 16′), or 111° 16′ West.

If B is 90° East longitude, A is 90° − (21° 16′), or 68° 44′ East.

6. We assume that the rent is payable in advance.

Aug. 1	3	mos.	credit	given
Nov. 1	6	"	"	"
Feb. 1	9	"	"	"
May 1	12	"	"	"
	4)30	"	"	"
	$7\frac{1}{2}$	mos.	average	credit.

May 1 + $7\frac{1}{2}$ mos. = Dec. 15.

7.

$$
\begin{array}{r|l}
 & 2'72.'35'70\ (16.503+ \\
 & 1 \\
26 & 172 \\
 & 156 \\
\hline
325 & 1635 \\
 & 1625 \\
\hline
33003 & 107000 \\
 & 99009 \\
\hline
 & 7991
\end{array}
$$

Article 300.

23.

Term of discount	120 days.	Face of note,	$875.00
Interest for	60 days	. . . . .	8.75
Interest for	60 days	. . . . .	8.75
		Bank discount,	$17.50 } Ans.
		Proceeds,	$857.50 }

24.

Term of discount	180 days.	Face of note,	$85.60
Interest for	60 days	. . . . .	.856
Interest for	120 days	. . . . .	1.712
Interest at 6%	. . . . .		$2.568
Interest at 1%	. . . . .		.428
Interest at 7%	. . . .	Bank discount,	$2.99 } Ans.
		Proceeds,	$82.61 }

25. 90 d. after Jan. 4, 1881 = April 4, 1881, day of maturity.
From Feb. 3, 1881 to April 4, 1881 = 60 d., term of discount.
Interest of $600 for 60 d. at 6% = $6.00, bank discount.
$600 − $6.00 = $594, proceeds, Ans.

26. 4 mo. = 120 d., day of maturity.
120 d. − 15 d. = 105 d., term of discount.
Interest of $5000 for 105 d. at 8% = $116.66, bank discount.
$5000 − $116.66 = $4883.34, proceeds, Ans.

27. Interest of $10500 for 6 mo. at 6% = $315.
$10500 + $315 = $10815, amount due at maturity.
6 mo. = 180 d., time of maturity.
180 d. − 60 d. = 120 d., term of discount.
Interest of $10815 for 120 d. at 5% = $180.25, bank discount.
$10815 − $180.25 = $10634.75, proceeds, Ans.

28. 4 mo. after Jan. 14 = May 14, day of maturity.
From Feb. 27 to May 14 = 76 d., term of discount.
Interest of $485.96 for 76 d. at 6% = $6.16, bank discount.

$485.96 − $6.16 = $479.80, proceeds, Ans.

29. 3 mo. after Feb. 12 = May 12, day of maturity.
From Mar. 8 to May 12 = 65 d., term of discount.
Interest of $966 for 65 d. at 7% = $12.21, bank discount.

$966 − $12.21 = $953.79, proceeds, Ans.

30. 2 mo. after April 1 = June 1, day of maturity.
From April 15 to June 1 = 47 d., term of discount.
Interest of $1024 for 47 d. at 7½% = $10.03, bank discount.

$1024 − $10.03 = $1013.97, proceeds, Ans.

31. 60 d. after May 5 = July 4, day of maturity.
From May 27 to July 4 = 38 d., term of discount.
Interest of $287 for 38 d. at 8% = $2.42, bank discount.

$287 − $2.42 = $284.58, proceeds, Ans.

32. 90 d. after July 10 = Oct. 8, day of maturity.
90 d. = term of discount.
Interest of $648.50 for 90 d. at 5% = $8.11, bank discount.

$648.50 − $8.11 = $640.39, proceeds, Ans.

33. 5 mo. after June 15 = Nov. 15, day of maturity.
From Aug. 4 to Nov. 15 = 103 d., term of discount.
Interest of $984 for 103 d. at 9% = $25.34, bank discount.

$984 − $25.34 = $958.66, proceeds, Ans.

34. 6 mo. from Sept. 20 = Mar. 20, day of maturity.
From Nov. 27 to Mar. 20 = 113 d., term of discount.
Interest of $328 for 113 d. at 4% = $4.12, bank discount.

$328 − $4.12 = $323.88, proceeds, Ans.

35. 30 d. after Aug. 25 = Sept. 24, day of maturity.
From Sept. 1 to Sept. 24 = 23 d., term of discount.
Interest of $696 for 23 d. at 4½% = $2.00, bank discount.

$696 − $2.00 = $694, proceeds, Ans.

36. 1 mo. after Oct. 31 = Nov. 30, day of maturity.
From Nov. 1 to Nov. 30 = 29 d., term of discount.
Interest of $842.50 for 29 d. at 3½% = $2.38, bank discount.

$842.50 − $2.38 = $840.12, proceeds, Ans.

37. 3 mo. after Sept. 7 = Dec. 7, day of maturity.
From Oct. 10 to Dec. 7 = 58 d., term of discount.
Interest of $500 for 58 d. at 6% = $4.83, bank discount.

$500 − $4.83 = $495.17, proceeds, Ans.

38. 75 d. after Nov. 12 = Jan. 26, day of maturity.
From Dec. 15 to Jan. 26 = 42 d., term of discount.
Interest of $8643 for 42 d. at 7% = $70.58, bank discount.

$8643 − $70.58 = $8572.42 proceeds, Ans.

39. 4 mo. after Jan. 17 = May 17, day of maturity.
From Feb. 10 to May 17 = 96 d., term of discount.
Interest of $242.16 for 96 d. at 10% = $6.46, bank discount.

$242.16 − $6.46 = $235.70, proceeds, Ans.

40. 90 d. after Dec. 27 = Mar. 27, day of maturity.
From Jan. 15 to Mar. 27 = 71 d., term of discount.
Interest of $800 for 71 d. at 3% = $4.73, bank discount.

$800 − $4.73 = $795.27, proceeds, Ans.

41. 3 mo. after Mar. 5 = June 5, day of maturity.
From May 1 to June 5 = 35 d., term of discount.
Interest of $560 for 35 d. at 8% = $4.36, bank discount.

$560 − $4.36 = $555.64, proceeds, Ans.

42. 6 mo. after Dec. 11 = June 11, day of maturity.
From Mar. 18 to June 11 = 85 d., term of discount.
Interest of $576 for 85 d. at 5% = $6.80, bank discount.

$576 − $6.80 = $569.20, proceeds, Ans.

43. 4 mo. after Aug. 8 = Dec. 8, day of maturity.
From Oct. 27 to Dec. 8 = 42 d., term of discount.
Interest of $898.96 for 42 d. at 9% = $9.44, bank discount.

$898.96 − $9.44 = $889.52, proceeds, Ans.

45. Bank discount of a $1 note for 60 d. at 7% = $0.0116⅔.
Proceeds of a $1 note = $1 − $0.0116⅔ = $0.9883⅓.

$1500 ÷ $0.9883⅓ = $1517.70+, face of note, Ans.

46. Bank discount of a $1 note for 4 mo. at 6% = $0.02.
Proceeds of a $1 note = $1 − $0.02 = $0.98.

$293.85 ÷ $0.98 = $299.84+, face of note, Ans.

Article 301.

47. Bank discount of a $1 note for 60 d. at 7% = $0.0116⅔.
Proceeds of a $1 note = $1 − $0.0116⅔ = $0.9883⅓.
$444.48¾ ÷ $0.9883⅓ = $449.73+, face of note, Ans

48. Bank discount of a $1 note for 6 mo. at 10% = $0.05.
Proceeds of a $1 note = $1 − $0.05 = $0.95.
$1520 ÷ $0.95 = $1600, face of note, Ans.

49. Bank discount of a $1 note for 90 d. at 6% = $0.015.
Proceeds of a $1 note = $1 − $0.015 = $0.985.
$828.95 ÷ $0.985 = $841.57+, face of note, Ans.

50. Bank discount of a $1 note for 8 mo. at 7½% = $0.05.
Proceeds of a $1 note = $1 − $0.05 = $0.95.
$483.56 ÷ $0.95 = $509.00+, face of note, Ans.

54. 1½% a mo. = 1½% ÷ 30 = $\frac{1}{20}$% a day.
$1 × $\frac{1}{20}$ × 60 = $0.03, bank discount of $1 for 60 d.
$1 − $0.03 = $0.97, proceeds of $1.
$5811 ÷ $0.97 = $5990.72+, face of note, Ans.

55. 4 mo. after Aug. 22 = Dec. 22, Ans.

59.

Term of discount	90 days.	Face of note,	$368.00
Interest for	60 days		3.68
Interest for	30 days		1.84
			$5.52
		Ans.	$362.48

60. 60 days after Jan. 31, 1882 = April 1, 1882, Ans.

62. Bank discount of a $1 note for 30 d. at 6% = $0.005.
Proceeds of a $1 note = $1 − $0.005 = $0.995.
$500 ÷ $0.005 = $502.51+, face of note, Ans.

63. 3 mo. 15 d. $= \frac{7}{24}$ y.

$\$750 \times .07\frac{1}{2} \times \frac{7}{24} = \$16.41$, interest of $\$750$ for 3 mo. 15 d.

$\$750 + \$16.41 = \$766.41$, amount of $\$750$.

Bank discount of $\$1$ for 45 d. at $7\% = \$0.00875$.

Proceeds of $\$1 = \$1 - \$0.00875 = \$0.99125$.

$\$766.41 \div \$0.99125 = \$773.18$, face of note, Ans.

64. 1 A. $= 43560$ sq. ft. $43560 \times .05 = \$2178$, sold for.

Bank discount of $\$1$ for 6 mo. at $5\% = \$0.025$.

Bank discount of $\$2178 = 2178 \times \$0.025 = \$54.45$.

Proceeds of $\$2178 = \$2178 - \$54.45 = \$2123.55$.

$\$2123.55 - \$400 = \$1723.55$, profit, Ans.



